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THE DENTAL REVIEW.

DEVOTED TO THE ADVANCEMENT OF
DENTAL SCIENCE.

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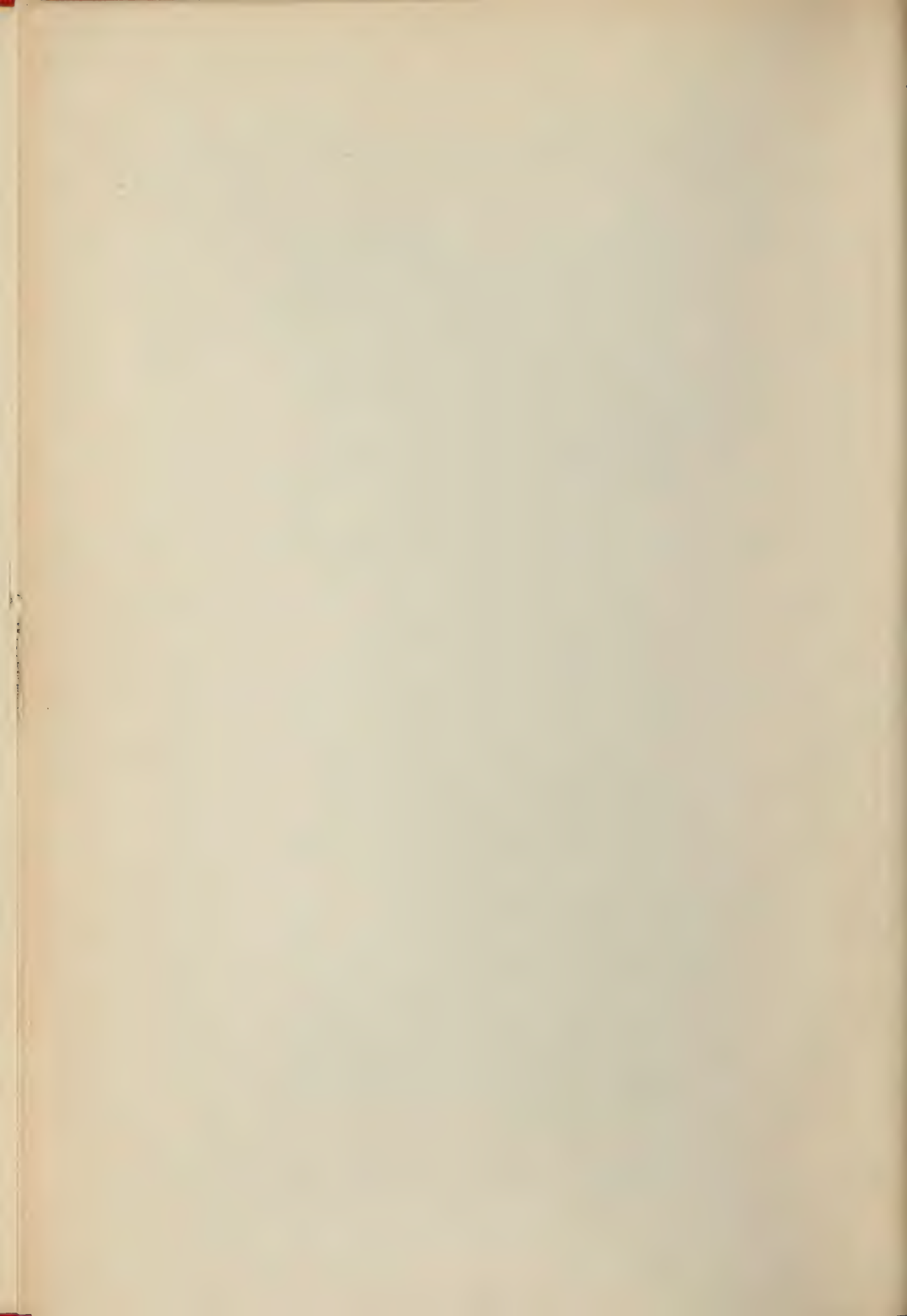
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VOL. X.

CHICAGO, JANUARY 15, 1896.

No. 1

ORIGINAL COMMUNICATIONS.

ANÆSTHESIA, LOCAL AND GENERAL.*

BY A. C. HEWETT, M. D., CHICAGO, ILL.

There comes but seldom in the life of a man so distinguished an honor as you, through your committee, have bestowed upon me. That I, a nonresident of your State, not a member of your society, at such an epoch of your State's profession, should be selected to lead in the discussion of anæsthetics, general and local, calls for gratitude that I am unable to express and yet creates anxieties that I have been unable to suppress.

Though not now a dweller on the soil of Iowa, I know the timber of its people; I know the lines along which your emigrants have come; I know the schools in which Iowa's children are taught. In your State are scholars, statesmen, orators, scientists that rank with the ripest and best of any other.

I know that members of the dental profession of Iowa who have thus honored me, come fresh from contact with those eminent in their several spheres; themselves, quick of apprehension, educated, profound thinkers. What wonder then that upon the opening of this question, I grow anxious as I take in the broadening field, the narrowest border of which I can only enter upon. However, remembering the marked kindness with which on former occasions you have received me and upborne by an increasing confidence in the justness and safety of the views I hold, I will go to the heart of my subject, advancing little of mere theory; striv-

*Read before the Iowa State Dental Society.

ing rather for the practical, that you may be assisted in your labors and that your patrons may receive at your hands the benison of your kindly striving.

It might be more pleasing to you, as it were fascinating to myself, to give the history of the use of anæsthetics early ventured upon, to note the dawning of the light then breaking, to moralize upon desire for fame on the one hand, and for money as well ; to argue for or against the propriety from a professional standpoint of Dr. Morton and Jackson obtaining a patent for etherization in surgery as they did, making oath to application October 27, 1846 ; to trace Dr. Crawford W. Long in his country practice in Georgia, no doubt wishing for surgery after giving J. M. Venable ether on March 30, 1842, and painlessly removing a glandular tumor from his neck ; to weave fiction with fact in the history of Drs. Long, Jackson, Wells, Morton, Simpson, Colton and Riggs. One, Dr. Wells, having committed suicide ; another, Dr. Morton, leaving his sick bed in a state of wild excitement and dying a few hours later in Central Park, New York ; a third, Dr. Jackson, becoming deranged, dying in an asylum ; and the fourth, Dr. Long, becoming stricken with paralysis while visiting a patient (Dr. Laird W. Nevius in preface to the "Dictionary of Modern Anæsthesia"), but the occasion and time forbid.

DEFINITIONS.

In order that there may be no misapprehension of premise and conclusion, I wish at the outset to define some of the terms I may use, and mark out what I understand to be the meaning of the named topics.

ANÆSTHETICS, GENERAL AND LOCAL.

Anæsthetic, adjective of anæsthesia. *Aisthesia* signifies perception sensibility. The coupling of the word, aisthesia, with the prefix, an, makes it mean literally, want of perception or sensibility ; same as *sthenia*, strength ; *asthenia*, want of strength ; *hamia*, blood ; *anæmia*, lacking blood. Dr. Oliver Wendell Holmes gives anæsthesia as the state or condition : a want of perception or sensibility, referring particularly to state or condition following etherization. Dunglison defines it, privation of sensation, especially that of touch ; paralysis of sensibility and gives it as general or local. He instances deafness (*anæsthesia acus-tica*) anæsthesia bulbar from injury of *pons varolii* or *medulla oblongata*,

anæsthesia linguæ, loss of sense of taste, and twelve or thirteen others. I shall use the term in its more restricted sense, as a privation of sensation or sensibility caused by administration of some drug.

Analgesia, analgia ; from algos, pain. The prefix, an, and algia, insensibility to pain, but not to impressions of touch or contact ; for example, morphine in full dosage, may act as an analgesic.

Obtundent, from obtundo, to beat against and blunt the edge ; whatever partially or wholly benumbs the nerves of sensation, blunts the anguish of suffering, may be said to be obtundent.

With these definitions as given, kept in view, I think my meaning will be plain while treating of

ANÆSTHETICS, GENERAL AND LOCAL.

Undoubtedly the committee who named my subject, had in view those agencies that are popularly supposed to have such powers rather than anæsthesias-analgesics or obtundents, such as pressure on nerve trunks, bulbs, ganglia or periphæria. Complete anæsthesias may result to a part of the body from accidental or intentional severance of, or pressure upon a nerve. Of these I shall not speak nor shall I follow the custom established by writers on anæsthetics, that a history of the one named must be given. I shall assume that the members of this convention will perfectly understand me when I name chloroform or cocaine, or ether, or gaseous oxide of nitrogen and do not need, and would not be enlightened by history or technical description, however extended or accurate. But you in common with myself, are keenly alive to the necessities of more and more accurate knowledge of the *when* to use, of *the* anæsthetic to *select*, *how* to administer the one chosen, and how the one selected operates, we are anxious to definitely and wisely settle the questions of success in the use of and the danger attending any or all. Whether if there is danger, it is inherent in the drug or in the preparation and exhibition. Of all these and more, I have been repeatedly and often reminded since I had the honor to give before your society some views in a paper, entitled "Things Old, New, and Useful in the Operating Room." Concerning these questions I have received letters from all points of the compass, from near

and far ; more than I could devote time to answer, but not one asking of the history or technical formulas or mode of manufacture.

Taking a hint from this indication, I will consider only the practical ; striving to answer some of the questions above given.

1. What demand is there for anæsthetics, general or local, in the practice of our profession ? I answer, the same that calls for their use in the practice of medicine and general surgery. Not alone where there is odontalgia or neuralgias, multiform as they are but in general, when pain is encountered or to be induced, that is not to be borne without shock or diminution of vital force on the part of the sufferer. And so long as patients and patrons of dental offices keep up the cry that rings in your ears and in mine of "dentistry is cruel," "the persistent cruelty of dentists borders on brutishness," "dental offices are inquisitorial places of torture," "I dread to enter a dental office," "I like you socially and as a friend, but I hate your profession," "Why did you, who are kind-hearted and humane, engage in so cruel a calling," and so on and on, *ad infinitum*. So long as we hear these things there is demand for them.

So general is the charge, so universal the complaint that little children who do not know the meaning of the word dentist, have to be dragged across our thresholds, and with quivering lips, pallid with fear, breaths tremulant with dread, beseeching eyes often filled with tears, beg for mercy before they reach the chair. You know that what I say is true ; you hear it in society, at the club, at weddings and funerals ; we are caricatured in theaters, written about in the papers, valentined in February. It is the same cry on the street, in the shop, everywhere. It is our shame and disgrace. A long way are we behind the medical and surgical profession in pain avoidance. I verily believe that in the offices of the 26,000 and more dentists of the United States there is more suffering, more agony deliberately caused daily than ever was borne in all the inquisitions of the world in a month.

What pain is severer during the time of its duration than that endured in the extraction of a tooth ? What pang more unendurable than that caused by the thrust of steel on an inflamed pulp ? What will send shivers down one's spine faster and colder than burring supersensitive dentine ? What will bring profanity to the

lips of real gentlemen and tears to the eyes and down the cheeks of women sooner than the grind of corundum or carborundum wheels across the cusps of teeth in preparation for crowns? Who likes the prod of the broach against the ultimate end of a root's pulp after arsenious paste has not devitalized it through its entire length? On one occasion I was in the office of a friend while such prodding was going on. The patient, a stalwart man, groaned, twisted and perspired till my friend innocently inquired, "Does it hurt?" Instantly the patient replied, "Yes, damn you, it does hurt;" and in a towering rage left the chair and the office. There is not a thoughtful man in this presence but knows that thousands of teeth are sacrificed daily in "painless extracting rooms" and "painless dental parlors," and tens of thousands of dollars kept from the pockets of conscientious, reputable dentists, because of the dread of such suffering as I have described, now supposed to be necessarily incident to repairing and preserving the teeth. Hence I answer in repetition and (particularizing) in all oral surgery, whenever the soft tissues of the mouth are to be wounded, the gingivæ pressed upon or disturbed painfully, in all extractions of teeth, deciduous or permanent, when fright to child or adult attends, and in all burring, cutting or grinding of sensitive dentine, in all operations upon or painfully contiguous to sensitive pulps, if absence of pain is desired by the patient, anæsthetics, general or local, to be used in full general anæsthetization or in local anæsthesias as the several cases require, should be in the hands of every operative dentist for daily, careful and intelligent use.

THE ANÆSTHETIC TO SELECT.

In all grave operations requiring time and repose of the patient, such as excision of the inferior maxilla, osseous removals of the superior maxilla, for the removal of tumors of any considerable size, whether benign or carcinomatous, excision, stretching or extirpation of inferior dental nerve, most operations for cleft palate, removal of adenoid growths from posterior nares, and others not necessary to name, a general anæsthetic should be given where local anæsthesia is not adequate.

WHAT ANÆSTHETIC FOR LOCAL USE?

Fortunately for your endurance in listening, the enumeration can be brief. Passing cold, heat, nerve pressure and that residing

in some of the essential oils, I shall only name one, erythroxyton coca and derivatives. To my mind all others have been tried and found wanting. Till further search shall reveal agencies as efficient, it were a waste of time to speak of any other. I do not hesitate to place tropa cocaine at the van; it is the prince royal of the coca line. (Exhibit.) The next one in importance is cocaine hydrochlorate or cocaine muriate. Unfortunately, the price of tropa cocaine is so high that it will not come into general use at present. I have been unable to procure it for less than thirty cents a grain; still wherever a local anæsthesia was needed, if I had to rely upon hypodermic use, I should pay the price, provided also that the muriate could not be as safely and beneficially employed. It is difficult for me to draw a just comparison between the two preparations, for I have used the tropa cocaine but sparingly.

For the benefit of those who must rely on hypodermic use, I will say that a 2 per cent solution of tropa cocaine is of ample strength; and I believe it is also safe to the amount of 4 to 6 drops injected, unless a blood vessel of some size is pierced or a nerve of appreciable size is severed. In the former case the drug might flow directly to the heart and cause collapse, perhaps death; in the latter case, paralysis of the supplied parts. Several cases have come under my notice of paralysis; one of the tongue, continuing some months; another of the left side of the face, lasting weeks; a third, a complete paralysis of the left arm, which lasted several weeks; all from injections by operators of so-called "painless dental parlors."

These cases do not argue, however, against the skillful use of cocaine. None but a coward will hesitate to skillfully, carefully use any beneficent agent, because with them some have ignorantly or carelessly caused death or paralysis. It is almost if not quite axiomatic that an agent potent for good is also strong for evil.

The cocaines are no exception, but I am addressing educated, learned men. You have traced the course of nerve, artery and vein and know how to avoid them in the thrusts of your needle point.

Theory suggests and experience demonstrates that cocaine hydrochlorate can be safely injected not only for tooth extraction, but for many surgical operations, and render them absolutely pain-

less. For local anæsthesia, the following formula is commended in theory and practice as efficacious and safe, no accidents or deaths having followed its oft repeated use.

R	Sulph. atrop	.....	gr. $\frac{1}{2}$.
	Sulph. strophanthin.....		gr. $\frac{1}{5}$
	Acid carbolic (crystals).....		gr. v.
	Hydrochlor. cocaine.....		grs. xx.
	Glycerin (pure).....		fl. 3 ss.
	Aq. pur. ad.....		$\frac{3}{4}$ ij.

M.

Sig. Four to six drops hypodermically. I have given this formula before, and during the years that have intervened, it has been in constant use, not in the extraction of teeth and roots only but for minor surgery by one of Chicago's noted surgeons, Dr. Oscar J. Price, and by many dentists, and so far without casualty or collapse, nor is there subsequent sloughing or inflammations.

I commend it without hesitation as efficacious and safe. While I do this I wish to be as emphatic in my caution against the use of cocaine muriate *alone*, no matter if the solution is as low as 1 or 2 per cent.

In my own practice, alarming symptoms have occurred following a couple of drops of 4 per cent solution in the eyes, one drop in each, preparatory to operating for ophthalmocnus. Nausea, facial pallor, general nervous tremors have supervened the application of a similar strength's solution to the anterior nares for catarrhal congestion, as in sudden colds and hay fevers, and so marked have been these disturbances that I have entirely abandoned the use of any solution of cocaine, unless guarded by some toxical antagonist for that purpose, I recommend strophanthin sulphas, and atropin sulphas. A favorite formula is :

R	Muriate cocaine.....	grs. xxxviiij.
	Sulph. atropin.....	grs. $\frac{1}{4}$.
	Sulph. strophanthin.....	grs. $\frac{1}{5}$.
	Beta naphthol.....	gr. j.
	Aqua dist....	ad. fl. 3 ij.

M.

Sig. For hypodermic or topical application. The cocaine should be in clean, well-formed crystals and not in fine powder. (Exhibit.)

Do any of you say that so small an amount of strophanthin or atropin cannot avail in two ounces of the mixture? To such I reply test those drugs upon yourselves as I have done on myself. Place $\frac{1}{80}$ of a grain of strophanthin well back on your tongue, wait a little, then take a mirror in hand and if you are a good colorist,

you may define the shade of red or purple that overspreads your face, then strive to detect in yourself some symptoms of syncope. Again, lay $\frac{1}{40}$ of a grain of atropin on your tongue and soon a dryness will pervade your throat and mouth, so that you cannot spit for a half day. If you then look well to your eyes, you will see that it is a mydriatic of much potency. Better than theory of objection or approval, experience has shown that, combined with cocaine, they add potency to it, while divesting it of its toxic terrors. There are in some of the essential oils anæsthetic properties, and in some excipients, as lanolin and glycerin, conveying tramways for cocaine, which act as adjuvants and are valuable aids to the main drug. So well convinced am I of it from personal experience, that I shall risk your merriment while I here repeat the formula I gave on a former occasion. For the purposes of experiment in reference mainly to this paper, I have tried to supplement the "pigment" by other combinations, simpler and yet as efficient. The result has been a return to the original formula with slight modification, increasing the amount of strophanthin and atropin. For nearly eight years, I have proven its value and tested it safely.

COMPOUND COCAINE PIGMENT.

R	Atropin sulph.....	gr. j.
	Strophan. sulph.....	gr. j.
	Cocaine hydrochlor	3 ij.
	Beta naphthol.....	grs. x.
	Oil caryophil.....	fl 3 ij.
	Chloroform pur.....	fl 3 ij.
	Glycerin to make.	fl 3 j.

M.

Sig. Use with applicator or hypodermically for local anæsthesia.

So use cocaine wisely, cautiously but fearlessly if wisely, remembering that the allectionation of science has led its votaries to the discovery of few agents exceeding in value that which nature has poured from her alembic into the frond of the erythroxyton coca.

GENERAL ANÆSTHETICS.

This and other lands have furnished us with a larger number of agents possessing general anæsthetic properties than is generally supposed. Time and space forbid the mention of but few, and the description of the effect and mode of administration of but two or three will be dwelt upon. At the head of the list as regards age and public esteem, I name alcohol.

I need only to name it and add a few words as to its mode of administration for anæsthesia before dismissing it.

To those timid as to the use of more vigorous agents it contains real value. Its administration should be preceded by a narcotic sedative, as the anæsthetic stage is always preceded by one of excitement. Immediately following the administration of some hypnotic, as morphine or atropine, the administration of some form of alcoholic liquor should be commenced. If brandy or whisky is chosen it is best given in teaspoonful doses, following a glass of water at first, at intervals of from three to five minutes. The intoxication may be carried to such an extent as the operator may desire.

By the exercise of self-control and a personal hypnotic command an operator can extract a required number of teeth or perform a minor operation in surgery with very little pain to the patient.

The other general anæsthetics I name are Ether, Pental, Gaseous Oxide of Nitrogen and Chloroform.

Ethyl bromide, perhaps, should be named. It is quite generally used, and of undoubted efficacy; but its administration is accompanied by cramp like spasms and cyanotic congestions that to my mind render it of far less value and quite as dangerous as the others. The literature of ether is so voluminous that I feel justified in dismissing it with a few comments. Its disgusting odor, the tardiness of the narcosis and the distressing subsequent effects effectually bar it for general use in dental offices. However, if used for full anæsthesia, a purer and more highly concentrated preparation than is generally used should be sought; and when administered the patient should not be condemned to breathe contaminated ether and vitiated air from the lungs into and from a tightly fitting mask held closely over mouth and nose. A chance for a little pure air and an uncontaminated drug should be given the sufferer. (Exhibited mask and inhaler.)

PENTAL.

This is a comparatively new anæsthetic. In its present state and purity it was introduced to the surgical profession late in the year 1891.

It is a colorless liquid, of low specific gravity, insoluble in water but miscible with alcohol, chloroform and ether. It is

highly inflammable, but of stable composition ; does not, like chloroform, decompose on exposure to light and air.

Hollander, von Rognar, von Merring, Weber and Mebes claim for it freedom from dangerous or unpleasant symptoms during narcosis or upon awakening.

Being a tri-methyl-ethelyne, C_5H_{10} , and perhaps related closely in its anæsthetic effects to what Dr. Richardson considers the safest of all (methylic ether), I think we may indulge large expectations for it. Since its introduction in (nearly) 1892, but a short time has elapsed in which to try any drug, any agent that shall seize the vital forces of life, volition, resistance muscular and neurotic, against which, sooner or later, we must perhaps write over against it "wanting." It possesses one feature that commends itself to my judgment, and that is that consciousness is retained even when there is insensibility to pain ; in that respect simulating what I term the analgic or obtundent influence of chloroform. It may be administered as is ether or chloroform from an inhaler like Young's, or from a mask such as generally used, from a cone, but better, for dental purposes, from the mouth of a bottle, as I advise for chloroform. (Exhibit.)

LAUGHING GAS.

Gaseous oxide of nitrogen, a substance so well known yet little understood, capable of rapid imbibition, of great power, bland, easily inhaled, praised by many, feared by the majority, is worthy of more than a passing notice ; but time and space will compel a briefer discussion than I would be otherwise tempted to give.

It is now generally supplied to the dental profession in a liquefied form, to be released into and given from rubber bags, or far better, into a gasometer of ample size, allowing the gas when liberated from the cylinder, to stand over a supply of water, that it (the water) may withdraw from the gas any acidulated or other impurities. Thus treated and used in my hands, it has proven unvaryingly efficacious and assuringly safe. Contrary to all accepted teaching of school and magazine, I assert its exhibition should always be accompanied by a generous supply of atmospheric air ; when thus exhibited, the sleep is profound though a little tardier in coming on, and there is an entire absence of spasmodic convulsions and cyanotic congestion.

From an experience with it covering a period of more than thirty years, when thus purified by water accompanied by a sufficiency of air, I cease to feel the slightest fear in its exhibition ; I consider it an indispensable necessity in a well-equipped office, and as an aside, I may be allowed to say that the full fledged dentist should rarely extract teeth, but when such extraction is necessary, he should be prepared for and should perform the operation himself, thus inducing him to extract but few teeth and preventing the savagery too often practiced by those whose profession is tooth extraction.

I think I should add that before its exhibition the patient should be sent to the water closet, and under no circumstances should it be given to pregnant women.

CHLOROFORM.

Of this agent some of you have heard me speak before ; to such what I feel in duty bound to say, will be largely a repetition. No one doubts its energy as a general anæsthetic ; no well-informed surgeon, physician or dentist will doubt its terrible toxic vigor.

Close study of its effects and an extended experimental investigation of it, commenced in the boyhood of my profession, continued up to the present time, at first prosecuted under difficulties so appalling to recollection, that I now wonder at my courage and persistence. Difficulties chiefly due to my lack of experience, unaided by definite literature on the subject, fiercely opposed by physicians and accoucheurs, when I began its use in aid of parturition, assailed as a reckless and "dare devil" experimentalist, stared at by what there was then of a dental profession (?) and prophesied evil of for my pertinacity, I was early impressed with its treasure of merciful benefaction, only waiting to be worked out from its arcanum and to be intelligently interposed between the forceps, bistoury, catling and shrinking, quivering human nerves. Would that my researches had been aided by a larger intelligence and that the words I now utter might reach the ears of a far greater audience than is before me, laden with the spirit of profound assurance I am compelled to bear, saturated and sent home by all the claimed force of intense hypnotic suggestion.

Since the time when alone in my office in Michigan, on a

bright Sabbath morning, I extracted my right inferior second molar, using both hands on the forceps, when under the analgic or obtundent influence of chloroform, absolutely without pain or shock (but filled the while with dread), I have known that lethea and death not only were hidden in chloroform's fumes, but that the wings of an angel of mercy were poised in its vapor, ready at call to sweep into temporary sleep the ultimate nervules of sensation without shadowing into inertia the breathing and heart beat, necessary to life's continuance.

It is well for me and for my personal freedom from prison walls or worse, that the analgic, obtundent forces of chloroform were, and are as harmless as they are proven. I had no guide in my experiments, while developing the, to me, new discovery; not a hint in the pharmaceutic, medical or surgical literature at my command did I have to aid me. On the contrary, "shock under partial anæsthesia" was early recorded, as it is still believed by many, mistaking shock of chloroform to the peripheral nerves spread upon the mouth, nose, throat and lungs and its consequences for the shock of forcep or knife.

It is difficult for you to imagine the fierceness of opposition I encountered in the years of my medical and surgical practice on account of my persistence in giving chloroform for minor operations in surgery, without calling other members of the profession in counsel. If a felon was to be lanced; a carbuncle to be carved, crucially; a phlegmon to be lanced, I gave chloroform in the same way that I do now, regardless of what professional men said, so long as my patients asked it and were satisfied with results.

If a woman in labor chose to avail herself of the analgic use of chloroform I gave it, at first with fear I confess, but soon with great satisfaction. From that early date to the time I now write, I have thus administered it thousands of times to old and young, to hale people and sickly, to nervous and stolid, and it is with pride and reverent gratitude that I announce that not a single casualty has marred my advance; not a collapse to affright me, but successes crowning one and another till my faith in it is a verity and my admiration for it unbounded. For the last twelve years, in my office at No. 491 W. Adams Street, Chicago, I have almost daily, and often many times a day, thus administered chlo-

roform and not a whisper has gone out of a casualty or attending untoward symptom.

On the contrary, thousands in that time have experienced its beneficence and warmly praised it.

I have thus spoken freely of myself, with seeming egotism of accomplishment, not because of conceit, far from it; but I have no other authority to quote.

So far as I know, I alone have pursued this line of investigation; so far as I am aware my paper above referred to, was the first published in modern times, announcing the discovery and the mode of administration; I believe my voice alone has sounded a challenge to the proposition that "There is danger from shock while operating upon a person partially anæsthetized." I now repeat the challenge. If the statement is true, that since that Sabbath morning spoken of, no casualties have resulted from operating under partial anæsthesia, may we not conclude that *said* "shock" is but a *bogy*, a *myth*?

I am firm in the conviction that as a general anæsthetic for the temporary suppression of nervous sensation, chloroform stands first as it certainly does for lethal effect in prolonged operations. It only needs intelligence and caution of a high order in its administration to render it safe. Dr. Syme used it in five thousand cases with perfect safety and I doubt not that had he used it in thrice or ten times that number, the result would have been the same had he not relaxed in prescient care. Dr. Sayre gave it in several thousand cases safely. It were a violent supposition to claim that the nearly ten thousand cases in the hands of those distinguished surgeons were all exceptionally safe ones. I dwell on this for the purpose of adding force to what I shall presently say as to the safety of partial anæsthesia for dental uses.

In passing, I wish to enter a vigorous protest against a practice almost universal among general surgeons, and one followed too often by oral surgeons, namely, that of giving the administration of anæsthetics for prolonged operations, into the hands of incompetent persons, generally that of students or internes, often of medical friends invited to witness the operation.

The best anæsthetic teachings have come from the dental profession. The surgical world may, without loss of dignity, listen to even my warning. Deaths from chloroform narcosis need not and *should not* occur.

HOW TO AVOID THE DANGER.

First. Prepare the patient by giving a respiratory and cardiac stimulant, and one ounce of pure brandy with half a glass of water should be given or its equivalent in some other alcoholic stimulant; a hypodermic injection of $\frac{1}{120}$ of a grain of sulphate of strophanthin, and $\frac{1}{60}$ of a grain of sulphate of atropin should be given, or what is more convenient place $\frac{1}{80}$ of a grain of the former and $\frac{1}{40}$ of a grain of the latter, well back upon the tongue, allowing it slowly to dissolve.

Commence inhalations of chloroform well mixed with atmospheric air in such quantities as will not induce flushing of the face, coughing, or the slightest irritation of the nerves of the nose, throat and lungs. Upon the strict observance of this rule depends the avoidance of the first danger to chloroform narcosis. If a mask is used, it should at first be held well away from the face and passed to and fro or rotated over the patient's mouth and nose, that the four times heavier than air vapor, shall be well mixed with the atmosphere; by all means do not irritate the nerve sentinels in the nose, mouth and throat placed there no doubt, with the especial design of sending irritation to the trigemini and medulla oblongata in presence of dangerous fumes or vapors. I cannot emphasize too strongly, the importance of observing these directions.

Thence on, give the chloroform vapor well charged with air, as rapidly as possible without irritation, never minding the pulse, caring nothing for the pupils, leave the heart to itself, but closely observe the breathing; if in the least retarded or shallow, wait a moment or two until regular respiration is established, thence on, keep well within this line. After the first danger of shock is passed the breathing will hang out the first red light signal of danger. Watch for this signal carefully, and if the operation is long continued and respiration becomes lazy, a hypodermic injection of some diffusible stimulant should be given. In the second stage narcosis is generally carried much too far, the slight underlying muscular contractions should in no case be entirely subdued. The muscles of the slaughtered ox when disemboweled, flayed, beheaded and quartered will for hours show these contractions when pricked or cut.

It were well for some of our surgeons to go to the slaughter house and take lessons. As to positions I prefer the semi-prone

or recumbent sitting if the operation will allow. If the recumbent position is required, place the head in that position well forward, always assumed by a person in strangling; in a position where the gravitation of the tongue will not be down the throat; no person will "swallow his tongue," if the head is in the proper position. If the respiration is properly watched and guarded, no forceps will be required for dragging forward the tongue.

The operator or oral surgeon should in no case be required to pay the least attention to the anæsthetic, but be left as free to work, as coolly and leisurely as though his subject were moribund, a condition into which too many of them pass by reason of the non-observance of the cautions herein given. I hope to see the time when in every college, dental as well as medical or surgical, a chair of anæsthesia shall be established at which a complete anæsthetic education may be obtained. Would that the progressive and all alive State of Iowa might lead in this important matter.

PARTIAL ANÆSTHETICS.

All authors treating of anæsthetics recognize the condition of partial, in contradistinction to general anæsthesia, and with one accord also treat it as a condition of extreme danger for painful operations and especially so in the region of the fifth pair of nerves. How this belief obtained I am utterly at a loss to explain; that I do not excede in the slightest degree to that belief I have stated before.

I would not allude to it again, only that I may the more thoroughly emphasize the caution I have given before, and now repeat, against shock in the early stages of anæsthesias. Shock may be defined, sudden depression of vital power passing into reaction or into fatal sinking. This is primary. A secondary shock may occur, which follows after the primary one has passed away. It is this secondary shock alone that may have led to the error; for error I hold it. I have proven it by experiments upon animals, producing partial anæsthesia and then inflicting extensive and shocking wounds and bruises till almost sick at sight of my seeming cruelty, and if the knife or blows did not reach a vital part, so far were they from producing shock, the subjects seemed to know or care very little for them until quite a time after recovery from the anæsthesia.

The major part and the most convincing of my experiments were upon human beings, and in parts supplied by the fifth pair of nerves, so that if shock were possible, I should have, sometime, somewhere, encountered it. I repeat it is a *bogy*, a *myth*. Do not let it awe you. On a former occasion, when treating of this subject, I gave what I thought plain directions as to the mode of giving anæsthetics to the point of obtundure to ultimate nervules of sensation, for with them we have to deal in "painless dentistry." (I use the last phrase in a restricted sense, not absolute.) I have been asked to repeat them and especially point out the indications that cry "enough." Perhaps I can best do so by giving directions how to extract a tooth, painlessly, safely and speedily; time, not more than five minutes. Position, sitting in the chair, tilted a little back perhaps twenty degrees from perpendicular; head in convenient position for operator. Paint the gums around tooth with com. cocaine pigment (which I greatly prefer) or with a 4 per cent solution mur. cocaine, guarded as in foregoing formula, using a small paint brush, as No. 2, with a stippling motion, dabbing the bristles against the tooth toward the free margin of gingivæ. If a little bleeding occurs, so much the better; immediately after commence giving chloroform *purificatum* from a wide-mouthed bottle (my choice), directing deep, long, steady inhalations across the bottle's mouth, through one nostril, the other being compressed by the operator, held at such a distance below the nose that but a faint odor of the drug can be detected by the patient; at the close of each inhalation remove the bottle from the course of the exhaled air and immediately replace under the open nostril, for a second inhalation, a trifle nearer each time; rate of breathing, about ten per minute. Operator should keep up a running fire of words to patient, such as "Don't talk," "Steady," "Take deep breaths," "Not too fast," "Deeper," "Longer," "Don't forget to breathe" and the like; all the time nearing the bottle to the nose, till at last the air will cross the bottle's mouth almost in a whistle. At this latter time, between each breath, shake the bottle to hasten evaporation of the drug. When sufficient is given, generally the first symptom apparent is a slightly lazy, tremulous, drooping, slow winking motion of the eyelids, and at the same time a slight relaxation of muscles and a settling down in the chair; often now the ala of the free nostril will partially close down upon the septum of the nose, so as to somewhat ob-

struct inhalation. Watching closely the breathing you will see a shallower inhibition with lengthening intervals. Now say to your patient, "Breathe" (in a sharp tone of command.) "Breathe deeper, longer," "Don't forget to breathe," (to yourself, "Keep cool, firm, collected.") Repeat these words to your patient, at the same time giving a sharp jostle of the body; about this time there will be a distinct pause in respiration, notwithstanding your command and shake. Do not be in the least alarmed. There is no pallor, no cyanosis, spasms or excitement, simply an interim in the inhalations.

Now is your time, but do not hurry, deliberately put down your bottle, take up your forceps carefully, leisurely adjust the blades and extract the tooth. As you close down on the tooth and begin to pull, your patient will breathe, frequently start up with a moan, soon to settle back and seem to say, "pull away, I don't care," and after the tooth is out, remain with head back and mouth open, long enough for the extraction of several others, and till he is aroused and told to lean over and free the mouth of blood, which will be done, followed by a rapid restoration and profuse expressions of delight in your method and skill.

Precisely in the same way may partial anæsthesia be produced for the relief from the acute pain of any dental burring, drilling, lancing, scraping, grinding or prodding.

The terrors of minor surgical operations may thus be defied, *and it is safe* not only in my hands, but in yours, *if* two rules of caution are observed.

First. Do not give shock to the peripheral nerves of the nose, mouth, throat and lungs so closely contiguous to trigemini and medulla oblongata. Why? Because the medulla contains the cardiac and respiratory centers and the nuclei of the hypoglossal spinal accessory and glosso-pharyngeal nerve. As well a stroke with a sand bag.

Second. Do not, after having passed the first danger, carry the anæsthesia so far as to put to sleep the ganglia, controlling respiration, heart beat and peristalsis.

It were criminal to do either. Can I give a more emphatic caution?

A WORD TO MY CRITICS.

At Davenport, in the joint conventions of Iowa and Illinois, at the Columbian dental congress and at Old Point American

association, last summer, the trend of criticism was the same. In brief it was, "The numerous deaths caused by chloroform proved it unsafe." And that though it might be safe in my hands, it was not advisable that dentists, in general, should use it even for partial anæsthesia. To the first, I reply, admitting numerous deaths, more numerous than they claim, but insist that it is because administered improperly; in other words, the dosage is improper. As well argue that because two grains of strychnine is a fatal dose that therefore one-sixteenth of a grain must not be given. Because an overdose of morphine is dangerous, therefore an eighth or fourth of a grain should not be given. I grant and urge that for full anæsthesia, for prolonged operations chloroform is dangerous and so are ether, penthal and all the rest, and should be given for that purpose only by those especially educated for that work and trained by experience to avoid the dangers *always incident to unconsciousness* of anæsthetization. Such administration of any anæsthetic may be likened to the necessity of giving the largest possible safe dose of strychnine, even to the verge of imminent danger, for the cure of paralysis, which should never be attempted except by those of undoubted skill and care.

An interne or nurse may be instructed and easily trained to administer $\frac{1}{60}$, $\frac{1}{30}$ or $\frac{1}{15}$ of a grain of that drug and that with absolute safety, even taking idiosyncrasies into account, but to resort to the larger dose is quite another matter.

To insist that partial anæsthesia cannot be safely produced by any or all of the members of the dental profession, aided by directions that I have given, but that the same is safe in my hands is a compliment as unmerited by myself as it is of doubtful justice to those who are educated, thoughtful men, so certified by diploma and license.

The work that I entered upon in the adolescence of my professional life, and without casualty have prosecuted until the present, is not one of danger if the guides I have given are followed.

A METHOD OF ANCHORING LARGE CONTOUR FILLINGS IN INCISORS.*

By C. N. JOHNSON, L. D. S., D. D. S., Chicago, Ill.

Under the above title the present essayist read a short paper before the First District Dental Society of Illinois, in September, 1895. It was published in the October issue of the *DENTAL REVIEW*, and from the number of communications received by the editor in response to it, and also from the number of inquiries made of the essayist, both in person and by letter it would seem that the subject has created some small degree of interest. The present paper is submitted for the purpose of making clear several points connected with this method, which appear to have been misunderstood or overlooked by many readers of the original paper. The failure to furnish drawings to illustrate the paper was largely accountable

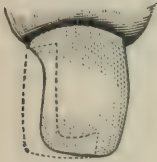


FIG. 1.

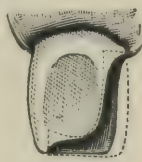


FIG. 2.

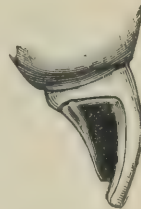


FIG. 3.

for the lack of comprehension exhibited, and in this particular the essayist acknowledges himself at fault.

Since then however—in the November issue of the *DENTAL REVIEW*—the method has been illustrated in a manner to make it clear, at least as clear as illustrations can make it. On page 791, Dr. Chas. J. Sowle presents a paper on the preparation of cavities, and in considering this particular form of cavity, outlines in brief the method advocated by me before the First District Dental Society. His article is illustrated—as mine should have been—and he has presented the matter precisely according to my own ideas. In fact Dr. Sowle had the best means of being familiar with this method from having listened to my lectures on the subject last winter in college, and from having had constant access to my models. It was evidently with these models in mind that he made the drawings for illustrating his paper. I therefore have pleasure in calling your attention to these illustrations which give a correct idea, especially Figure 4, (Figure 2 in the present issue) of the method.

*Read before the Chicago Dental Society December 3, 1895.

To render intelligible some of the remarks I purpose making on the published comments called out by my former paper, I must repeat some of the substance of that paper. After waiving any attempt to claim originality for the method I say: "Given a case where the pulp is dead and the anchorage is usually easily obtained, but where the corner is gone without much penetration of the decay toward the pulp, the result is a shallow cavity which seems to tax the average operator in his attempt to gain sufficient anchorage. From observation it would seem that the majority of operators prepare the cavity in the following manner: After the usual conformation is given the cervical portion of the cavity, anchorage for the occlusal half of the filling is obtained by drilling obliquely into the cavity toward the occlusal surface between the two plates of enamel as they come together. Anchorage of this form frequently develops a weakness which results in a loosening of the filling as follows: The gold which is built into the occlusal undercut becomes slightly battered or compressed as the result of force exerted on the end of the filling, and the whole filling is thus allowed to tip away from the cavity, leaving a seam or space between the filling and tooth. In some cases a filling will remain partially dislodged in this manner for a considerable time without a perceptible loosening, while in others the filling is forced bodily out of the cavity shortly after its insertion. It will readily be seen that any compression of the gold in the act of biting upon it will lift it away from its close adaptation to the occlusal undercut, and result in a leakage of the filling, if not in a total dislodgment. * * * * Let us suppose we have a large mesial cavity on a left upper central incisor. There is little penetration of the decay toward the pulp, but the entire mesioöccusal angle of the tooth is gone. This form of cavity apparently presents greater difficulties to the average operator than where the decay has penetrated deeper.

"In the present method of preparation, the cervical half of the cavity is shaped in the usual way, being liberally extended cervicobuccally and cervicolingually. To obtain anchorage at the occlusal portion of the filling instead of drilling into the axial wall in the ordinary manner, a groove is cut along the occlusal surface leading from the cavity distally to near the distoöccusal angle. This groove must be made sufficiently wide and deep to admit of a large enough mass of gold being packed into it to insure strength,

and in order to accomplish this in teeth with thin occlusal surfaces, it is often necessary to cut away the lingual plate of enamel somewhat freely. This may be done with safety, provided the enamel margins are properly beveled and gold built over them in the insertion of the filling. The distal end of the groove may be deepened somewhat to assist in retention.

"The philosophy of this form of anchorage consists in two things: First, it will prevent absolutely the tipping of the filling previously alluded to; and second, it increases materially the seating capacity of the filling. * * * * * With the form of anchorage just outlined, it becomes impossible for a filling to get out of a cavity short of a breakage, and if the mass of gold is made thick enough it will not break. It is readily seen that the greater the force brought to bear upon the filling in the closure of



FIG. 4.

the teeth, the firmer it is driven into the cavity, and if there should be any compressibility of the filling material the tendency would be toward a closer adaptation to the cavity walls instead of a lifting away, as in the ordinary method of anchorage."

And farther on I say: "There are, of course, many cases of contour fillings in incisors where this method is not applicable, such for instance as a pulpless tooth where the decay is deep, or where the dentine is badly involved and the lingual wall gone for some distance toward the neck. These are the cases, however, where anchorage in other ways is easily obtained, and every operator must discriminate carefully, and decide for himself which method is indicated in each case that presents."

I have repeated this last paragraph for the purpose of showing that I am not the extremist in this method that some have given me credit for. I recognize perfectly the limitations of any

one method of procedure and am continually advocating discrimination in the application of means and methods.

I now wish to refer briefly to two articles in the November issue of the DENTAL REVIEW commenting on my paper. One is by Dr. H. A. Cross, page 812, the other by Dr. George H. Wells, page 819. These gentlemen suggest a similar method of anchoring fillings which is a modification of the one outlined by me. It is explained by the illustration (Fig. 4). This method exhibits an encouraging degree of thoughtfulness on the part of the gentlemen suggesting it, for it shows that they have recognized the inefficiency of the ordinary methods of anchorage.

I am inclined to believe, however, that this method, while probably applicable to certain cases, as is evidenced by their success with it, has limitations which in ordinary practice must not be lost sight of. It would appear to me that to cut into incisors in the direction indicated by the diagram, and to a sufficient depth to gain adequate anchorage, would be in many cases to approach too near the pulp. The horns of the pulp in many incisors extend so far crownwise as to render dangerous any depth of penetration at the point indicated, and while in the hands of careful operators such as these gentlemen undoubtedly are, an avoidance of this complication would probably be assured, yet I fear that a general following of the plan on the part of the profession would result in much injury to living pulps.

Another limitation which it seems to me the method presents is the fact that the point of anchorage is too far removed from the point at which the dislodgment force in mastication is likely to be applied, and it therefore admits of greater leverage for dislodgment than if the point of anchorage were at the occlusal surface where the force of mastication is exerted.

An objection urged by Dr. Wells against the method outlined in my paper was the fear that the reflection of the gold might show through the labial plate of enamel. I am glad that the doctor brought up this point, because it makes it possible for me to caution the profession against a mistake which some are evidently making in the attempt to practice this plan. The labial plate should not be cut thin enough to cause this form of disfigurement. As I stated in my paper, it is often necessary to cut away the lingual plate of enamel somewhat freely in order to gain sufficient bulk of gold for strength, but the labial plate should be left stand-

ing thick and strong. In the many fillings of this kind that I have inserted I have had no complaint on this score from my patients.

I herewith present for your examination a large plaster model, the one referred to in my first paper, and I also have great pleasure in introducing to you this evening one of my patients for whom I some time since filled a tooth in this manner. It has seemed so difficult to illustrate the method effectively, or even to present it perfectly with models, that I have frequently wished I might have the opportunity of exhibiting a case in practice. Upon the day I promised the secretary to prepare this paper, a case for which I operated last spring chanced to present at the office, and the patient kindly volunteered to be present this evening. The history of the case is as follows: The two central incisors lost their mesioöcclusal corners by decay. They were contoured in the ordinary way by a most competent operator in California. Anchorage for the occlusal half of the filling was gained by drilling into the axial wall between the two plates of enamel. In the right central the filling has remained firm, as you will see; but in a very short time after insertion the filling in the left central had been forced out of the cavity in the manner indicated already in the paper. I removed it and inserted another early last June. I have not touched it since then, nor did I have the slightest idea at the time of its insertion that it was subsequently to be exhibited before a dental society. I now invite you to inspect it.

THE PROTECTION OF THE CERVICAL BORDER IN PROXIMATE CAVITIES.*

BY LOUIS OTTOFY, D. D. S., CHICAGO, ILL.

It is impossible to evade the fact, that fillings of any material, made by the best of hands will fail. That the proportion of failure is anything but reasonable or satisfactory, and that not sufficient progress has been made before the closing years of this century, to have eliminated the word "fail" from the vocabulary of the dentist, is apparent. There are numerous causes for the failure of fillings, and as rapidly as we become acquainted with them, it behooves us to analyze them, and if possible, to remove the ele-

*Read before the Hayden Dental Society of Chicago, December 16, 1895.

ments of uncertainty. The mechanical principles involved in the anchorage of fillings and the consequent insertion of fillings in such a manner as not to fail for want of firmness, is probably the best understood of any of the causes of failure, and many valuable suggestions have been made during the past years with a view of lessening the chances of failure from this cause. The incompatibility of tooth material and filling material is an important factor in failures, and the study of this subject, now pursued by men of special ability, will also result in the reduction of the number of failures from that cause.

No matter from what cause, the fact remains that the large majority of fillings fail at the cervical border, hence that location is either the most vulnerable point encountered or the most difficult to protect, or both. My experience inclines me to the belief that both of these factors play an important role, as regards the number of failures with which we meet, and it is with a view of eliciting a discussion, and an expression of the methods pursued by the various members of this society, rather than in the hope of presenting something new, that this paper is read at this time.

Excepting the accidental causes, such as fractures of the enamel, pits and grooves, recession of the gums resulting in exposure of the pericementum, attrition, erosion and abrasion, caries is most frequent on the proximal surfaces of the teeth, at which points, its inception, progress and recurrence is, in most instances, impossible to control. The frequent recurrence of caries at this point, around fillings which have been inserted by the most skillful practitioners has led to the development of various methods of protecting this border, and strange as it may seem, it has led to the advocacy of inferior metals as better adapted for this the most important part of the filling; or the use of that character of gold which in other localities does not exhibit the most salvable properties. The methods for protecting the cervical border include the use of amalgam, combination of tin and gold, soft foil or cylinders, crystal gold, etc. It is eminently improper to use cohesive gold. This statement is especially remarkable when we remember that the greatest achievement of tooth salvation is due to the use of gold in the cohesive state. First I wish to commend the statement that cohesive gold is not a suitable material for protecting the cervical border. While gold per se

is suitable, the state in which it is, and the manipulation which in that state it requires, makes it unsuitable in this location.

In taking up the various materials employed in this location, I must record my objections to the preparations of gold which come under the head of crystals. In my experience they have proven unsatisfactory, not so much from any difficulty encountered in protecting the margin, as from the fact that the gold is liable to crumble or peel off; especially is this the more frequent in those cases where the interdental spaces have either been obliterated, or where they have not been restored, or where the loss of teeth has resulted in a change of position of the teeth; leaving in either case a non-self-cleansing space, compelling the individual to constantly dig into these places, with poles and rails of wood, ordinarily known as toothpicks; or what is worse, pins, hairpins and other metallic substances. The crystal gold will not withstand even the ordinary wear and tear of a well-shaped and properly adapted quill, intelligently used in what may be considered a fair interdental space. I much prefer a layer of soft or non-cohesive gold, although it is open to the same objections as to the liability to injury from toothpicks, but is not as liable to crumbling and peeling as the so-called crystal forms.

The use of amalgam has in some hands been followed with favorable results. When resorted to, it is used in two ways; first the cavity is properly prepared and a portion of it is then filled with amalgam, the patient is dismissed, and at the next sitting the amalgam is finished and polished, when the remainder is ready for the reception of the gold. According to another method the amalgam is introduced, and before it has set, gold foil is packed into it, the first layers of gold take up the surplus mercury; the filling at this stage having the color of amalgam, as the surplus becomes less and the quantity of gold increases, the filling assumes the color of and finally becomes entirely gold. Thus there results a layer of amalgam, followed by a layer of gold, completely taken up by the mercury, this gradually shades down, being less and less impregnated by mercury until it has become entirely free from it, and is from there on a gold filling.

My objection to the first amalgam method is the following: If amalgam need be resorted to for the reason that it will better save the cervical border, it is not incorrect to assume that if it serves better than gold at that point, it may be equally as good in

exposed locations, and a filling that must require two sittings for its completion, could probably be as well treated with amalgam at one sitting.

The second method is also open to objection. If amalgam is introduced and it is expected to be used as a foundation at once, it must be protected from spreading out of the cavity by the use of a matrix, and if a matrix can be applied with sufficient accuracy to prevent this, then why use the amalgam at all? In my hands I have never felt safe or secure after having thus made use of amalgam, although I admit that I have used it only in the most desperate cases.

The material which I wish to recommend and which in my hands has met with the most favorable results, is the well known combination of tin and gold. One sheet of tin carefully folded within one sheet of No. 4 noncohesive foil.

I well remember the difficulties I first met with in trying to use tin and gold, and I am satisfied that its use is abandoned by many because of a lack of persistence in overcoming these difficulties. In the first place the tin should be folded carefully within the gold, so that when it is cut up no tin is visible. In introducing it into the cavity, the pieces should be large enough to fit the floor or seat of the cavity, and not so large as to be crumpled up in their introduction. A very large plugger, coarsely serrated is best adapted for condensation; the material should merely be pressed into place and not packed, in the sense in which gold is packed into a cavity. Care should be taken not to injure the gold and thus expose the tin, but have gold come in contact with gold as much as possible. Gradually pieces of noncohesive gold should be added, followed by semicohesive and finally cohesive.

One of the advantages of tin and gold lies in the fact that it can be used under moisture; while it is not well to use any material under moisture, when the circumstances compel us to do so, I know of no material which can be worked as favorably as the combination of tin and gold.

Another advantage is that it does not require as close condensation as anything else we could use. I am not certain what reason is assigned for this, but probably the fact that the exposed tin oxidizes, and we have the material when porous, increased in quantity by the formation of this oxide, accounts for it. This oxi-

dation, furthermore, is claimed to be of some therapeutic value. Whether that is true or not, any one who has removed tin and gold, will have seldom found the surface formerly in contact with tin and gold attacked by caries.

This covers the subject of protecting the border on account of its vulnerable location. But aside from this, failure is also due to the difficulty of properly preparing and then reaching all parts of the prepared cavity. I cannot recall any more perplexing operation than that of faithfully following up the white or chalky lines, which adjoin the margins of proximal cavities proper. It is needless to say that half the battle is won when these chalk lines have been followed up and prepared, and the other half is won when they have been properly protected. Save tooth structure whenever you can, but cut fearlessly when trailing after chalk lines, is a good rule to observe.

Finally, the cervical border is never properly protected unless the final finishing of the filling or shaping of the tooth is accomplished on true mechanical and physiological principles. By the mechanical principles I mean that the seat of the cavity should be ample so as not to put too much strain on the border itself, for that requires protection, and a surface requiring protection is not usually fit to give support. By the physiological principles I mean the preservation of the normal interdental spaces, and this usually demands a restoration of the contour of the tooth, so as to secure as good a self-cleansing space as possible.

ELECTRICITY AS ADAPTED TO DENTAL SCIENCE.*

By H. B. WIBORG, D. D. S., M. D., MILWAUKEE, WIS.

This is the electric age. The history of the world has been one of cyclic development. The bone, stone, copper and bronze ages have come and gone. We have had the iron age with us and still have it. The conditions of social economics that gave rise to Mark Twain's "Gilded Age" had its ephemeral existence, and now the dawn of the electrical age has for some time past been brightly gleaming in the eastern horizon of the scientific world and soon it will reach the zenith and burst forth in all the brilliancy of noon-day splendor. Electricity. What is it? Does any man know the

*Read before the Wisconsin State Dental Society at Madison, July 17, '95.

true nature of this wonderful force pervading the organic and inorganic world? No; but centuries of investigation have taught him that the observance of certain laws which have been demonstrated to be theoretically correct will accomplish certain results. When that sage philosopher Benjamin Franklin demonstrated the close relationship existing between the lightning flash generated in the clouds above us, and the electric manifestations which the ancients produced with their little bits of amber thousands of years ago, his wildest conception would not have permitted him to even dream of the possibilities of a fraction of what has been accomplished in the latter part of the nineteenth century; and the end is not yet.

The theme of my essay to-day is—Electricity as Adapted to Dental Science. To what extent then has the dental profession taken advantage of the progress made by investigators in this collateral field of science? What does the profession as a whole know about electricity? Has it kept abreast of the times in the same ratio that some of the other professions have? These are pertinent questions, gentlemen, and we ought to take them home with us and seriously consider them; it is our duty as loyal and progressive members of our honorable profession to use every means in our power to advance it to the highest plane of excellence and maintain the prestige which has been accorded it as a thoroughly scientific profession. A quarter of a century ago when the little infant society whose twenty-fifth anniversary we are now celebrating, opened its eyes for the first time in the then comparatively small dental world, advanced thinkers in our profession wrote essays for the journals suggesting the wide range of future possibilities through the conservation of this wonderful force of nature, electricity. Knowledge of the various properties of this subtle fluid was vague and empirical then. Rapid and wonderful indeed has been the advancement made in dental science, but electricity has not only kept pace with it, but in many respects has outrun it. To-day it has been reduced to the condition of a mathematically exact science. Some of those dentists who are continually singing about the rapid advancement which has been made in their profession and yet are content to quietly stand by like drones in the beehive and permit the brunt of the labor necessary for this advancement to be borne by a few energetic workers, would be very much astonished if they would carefully investigate and see

how many collateral subjects like electricity for instance, that might be taken up and studied with advantage to themselves and the profession at large. The dentist is a very busy man it is true, but that is no reason why he should not study and investigate for himself in other channels than the seemingly more practical fields of his profession.

It is not my purpose to-day to present a treatise on electricity nor is it my purpose in this paper to consider the merits or demerits of the various appliances that have been presented to the dental profession for their consideration ; but it will not be amiss to consider for a few moments the sources whence we derive electricity and its practical application.

The uses to which electricity may be applied in dentistry are—generally speaking—twofold, viz. : Mechanical and therapeutical. To thoroughly comprehend this subject it will be necessary to consider a few technical terms. In order to render electricity available for commercial or scientific purposes we recognize a number of units of measurement, the three principal ones of which are the volt, ampere and ohm. The volt is the unit of pressure or force ; the ampere is the unit of quantity, and the ohm is the unit of resistance, and represents an amount of electricity sufficient to overcome the resistance caused by the interposition of a piece of copper wire of standard diameter and length. In addition to this, for therapeutical purposes we subdivide the ampere, which you will remember indicates the quantity of current into divisions of one one-thousandth which is called a milliampere. For ordinary therapeutic purposes eight or ten milliamperes (or the one hundredth of an ampere) suffices ; sometimes, however, it may be necessary to use as high a quantity as 250 milliamperes or the one-fourth of an ampere ; this latter is the maximum usually.

It will not be necessary for us to consider the physical aspect of electricity. You know the current has two polarities ; viz. : positive and negative, and this leads us to consider the sources whence we derive the electricity.

First, we have batteries, either open or closed circuit. As an illustration of an open circuit battery we have the Le Clanche or any one of a similar type such as is used for bell and telephone purposes. They consist of a glass jar, zinc and carbon elements, and a solution of sal ammoniac in water. They are called “open circuit” because they can only run for a few minutes at a time. If

used for too long a time at once, the zinc is acted upon too rapidly; hydrogen gas is evolved which collects on the carbon or positive element, thus preventing the passage of the electric current; a battery is then said to be polarized. The pressure or electro-motive force (E. M. F.) of each cell is about one volt, and the current quantity about one ampere.

In the closed circuit cells we use the same elements, viz.: carbon and zinc; with this exception that instead of sal ammoniac as the exciting solution, an acid, either sulphuric or chromic, is used. As soon as the carbon and zinc is placed in the acid the electrical energy manifests itself. When the cell is not in use, the zinc element is either taken out or by some means drawn up out of the way of the acid; this method represents the Grenet type of cell, and with it we may run a small electric mouth lamp or a small motor for several hours continually, but at the end of that time the battery will have exhausted itself, and it will be necessary to renew the solution. To obviate this difficulty in the improved cells the zinc is placed within a porous cup and acted upon by a very weak acid solution, while the carbon outside of the porous cup is acted upon by a very much stronger solution. Such batteries have been used for several hours daily for months without any attention. The voltage is about two and the amperage may vary anywhere from one to fifty according to the size of the battery elements. In this connection I wish to call particular attention to the fact that no matter how large or how small a battery cell may be the voltage or pressure remains the same for the class of cell under consideration, but the amperage or quantity of current produced will vary according to the size of the plates exposed to the action of the acids or other substances used to excite or create the electric current. The next form of battery to be considered is the storage or secondary. The class of batteries previously mentioned are known as primary batteries. The storage battery as developed to-day consists essentially (with various modifications) of a glass jar and two or more plates of sheet lead. On one side of one plate is spread a paste made of red lead which forms the positive electrode, and on one side of the other plate is spread a paste made of litharge and which forms the negative electrode. Now, when these prepared plates have been placed in water made slightly acid, the plates are connected to the poles of either a dynamo or primary battery and the current turned on. This current in traversing the battery from one pole to the

other meets with resistance in the lead plates and in order to overcome this resistance an electro-chemical action is set up and decomposition of the pastes spread on the lead plates occurs. When this decomposition ceases the battery is said to be fully charged. Owing to the removal of the charging current and the fact of the plates still being in acidulated water it immediately seeks to return to its original condition, and if the battery remains unused for a long time it will eventually do so and have to be recharged.

In charging a storage battery the charging current must be the stronger of the two; otherwise the storage battery will discharge itself. The same rule as to voltage and amperage of a given sized storage cell holds good as in any form of primary cell, *i. e.* the voltage will remain the same no matter how large or how small the lead plates may be, but the amperage or quantity of electricity stored up or discharged depends upon the surface area of the plates—the greater the surface the more amperage.

The next source of current supply to be considered is the dynamo, by which means two forms of current are generated, the continuous and alternating. For therapeutical purposes these two currents are about equally useful. For other dental purposes, mechanical, etc., the continuous current will, at the present time, usually be found the best to use. For the purpose of generating great heat such as is required for porcelain baking furnaces the two currents will be found equally useful. In view of the rapid advances being made in the development of the alternating current, and more particularly in view of the economical production of this form of current as compared with the continuous, inventors are rapidly devising appliances which shall enable dentists to utilize this current where the continuous is not available.

There is another form of current known as the "dry" or "static," which is generated by friction machines. As this current has not been demonstrated to have any great value in dental practice we will not consider it, although it has valuable properties in relieving the various affections of the fifth pair of nerves as well as the other nerve trunks and centers of the body. It is well worth investigating, however, for experimental purposes.

In therapeutics the current is arranged for tension or quantity according to the nature of the case in hand. For electrolysis we require tension and but little quantity, and for that purpose weak open circuit cells like the Le Clanche are commonly used. For

cautery purposes we require a quantity and so large cells are used ; for this purpose the storage battery is unquestionably the best. For tension a number of weak cells are connected, the zinc of one being connected with the carbon of the next, and so on. For quantity the zincs of all the cells are connected together, in one series, and all the carbons connected together in another series.

Electrolysis is positive when the effect of the positive current is considered, and negative when the results are those of the action of the negative current.

The positive current is anodyne ; soothing ; it has a drying coagulant effect.

The negative current has a stimulating, irritant effect ; it has a softening, liquefying action. The positive pole is acid ; the negative is alkaline.

If we desire to avail ourselves of the action of secondary products of electrolysis, we use, for instance, electrodes made of zinc or copper. To illustrate : suppose you want to deposit chloride of zinc salts in a pus pocket or along the necks of teeth, in order to avail yourself of its germicidal properties. All you have to do is to inject an ordinary solution of salt water, introduce your positive electrode made of zinc, and you immediately have chloride of zinc deposited just where you want it. The positive pole liberates oxygen and chlorine and is acid in its reaction. The negative pole liberates hydrogen, and is alkaline in its reaction. I mean of course when it is brought into close contact with animal tissue. Gross destruction of tissue can be caused by either pole. The eschar resulting from the positive pole is dry and hard ; that from the negative is soft.

Cathaphoresis is another phase of electro-therapeutics that demands attention. By this term we mean the transmission of remedial substances in fluid form into the tissues by means of the electric current. Local anæsthesia through the use of cocaine or other medicaments may be induced in this manner.

We have spoken of the positive current being soothing and anodyne in its properties. Here is where it may be of great value to the dentist in the treatment of inflammation of the periodontal membrane. Dr. Marshall, of Chicago, who uses it frequently for this purpose, speaks of the beneficial results obtained in unmeasured terms of praise.

The faradic current may also be made use of in diagnosing

a hypersensitive state of the pulp. If every tooth is tried in turn the unhealthy one will respond more quickly because it will not bear so much current as a healthy one. For this purpose a milliamperemeter is necessary.

The cautery. How many dentists avail themselves of this very convenient method of dealing with adventitious growths in the mouth. It is unnecessary for me to say anything about it; you all know its value.

As an aid in the extraction of teeth, electricity has not proven as successful as we might have wished, but I feel perfectly confident, in view of the number of our professional brethren who are giving the subject their serious study and attention, that ere long it will be the only form of anæsthesia we shall require.

With the use of electricity in the mechanical branches of their profession, dentists as a rule are more familiar, particularly with motors. These are usually series, shunt or compound wound and for dental purposes in conjunction with the continuous current there can be no question as to the value of the shunt wound as compared with the other forms. The trouble with alternating current motors is, they are so noisy that no dentist with any regard for the nerves of his patient or himself would want one around, but this very serious defect is rapidly being overcome and before long they will be practically as noiseless as those made for continuous current. Another serious defect in the alternating motor as now made is that they are not reversible except through the intervention of complicated mechanical devices.

The use of electricity for root canal drying, the electric mallet, the mouth lamp and for hot air are things very familiar to the majority of the profession. The value of the electric light as an aid and necessary convenience in our operating rooms is so patent to us all in this age that we scarcely give it a passing thought. And now we have furnaces, invented by dentists for the use of dentists, capable of fusing anything from a single tooth to a complete set of continuous gum work; capable of generating a heat of over 3000° F., and readily fusing platinum and the most refractory of metals.

As I said before I have no desire to deliver a treatise on the subject of electricity, or enter into the minutæ of its mys-

terious properties, but I realize that we are on the threshold of future electric possibilities in our chosen profession and if I have stimulated thought in this direction in the minds of a single person here present, I shall feel amply repaid for the slight efforts imposed upon me in presenting this subject for your consideration.

MISCONCEPTIONS IN THE PATHOLOGY OF RHEUMATISM.*

BY V. A. GUDEX, M. D., D. D. S., PROF. OF BACTERIOLOGY, MILWAUKEE,
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A little theory having as a nucleus the examination of the roots of six teeth, somewhere in Philadelphia, has been a topic of discussion among the profession for some months, and is still an entertaining feature at our dental meetings. Just the same, the poor sufferer of pyorrhœa alveolaris, runs his usual course of treatment to the extent of exhaustion of both purse and patience; finally he has his teeth extracted and pays the doctor for curing until dead.

Uric acid is boldly charged as being the procreator of gout and rheumatism, as well as the demon causing this trouble. Upon this theory one great dental firm has invented and is advertising a pseudospecific, a remedy par excellence, that can dissolve, wash out or cast out this terrible stuff, uric acid. This great remedy has such a marvelous effect, and is so very harmless to the system that the dentist who uses it, needs absolutely no brains as to its application; all he has to do is follow the directions on the label.

Numerous cases have been cited to substantiate this uric acid claim; but on careful reading it becomes plainly evident that a thorough examination of the patient's condition had never been made. Positive conclusions were drawn from very superficial observations. It remains now for us to see where errors occur.

Before proceeding further, let me define what I understand by pyorrhœa alveolaris. I notice that there are many entirely different conditions to which this term is applied. Therefore, the term must be restricted in its meaning, if it is intended to convey something definite. Pyorrhœa alveolaris is a progressive suppurative and destructive disease of the dento-alveolar membrane, running a chronic course, usually resulting in the destruction of the before

*Read before the Minnesota State Dental Society, St. Paul, September 11, 1895.

mentioned membrane, in whole or in part, and in the absorption of more or less of the alveolar process. This definition, like all others, is open to objections.

Incipient tuberculosis of the dento-alveolar membrane resembles pyorrhœa alveolaris very closely, and a little care is necessary for differential diagnosis. The fact is, no positive diagnosis can be made in the earlier stages, except with the microscope. In later stages, differentiation is easy. Tuberculosis usually destroys large portions of tissue, and does not stop with extraction of the tooth. Pyorrhœa is limited to the peridental membrane, necrosis very seldom follows, and extraction generally affects a cure.

A tooth having a live pulp may become painful on pressure from more sources than one; anæmia, reflex neurosis, oxostosis, inflammation or degeneration of the pulp, traumatism, mercurialism, lead poisoning, scurvy, etc. So pain caused by pressure on a tooth, with an accompanying sore toe, is not a reliable basis on which to render a diagnosis of pyorrhœa.

Anæmia presents some phases which might very readily be mistaken for the new kind of rheumatism. I wish to report a few cases, which I hope will be of interest:

Mr. L———a mail carrier, called on me one evening with a most annoying pain in a lower left third molar, which had elongated so that occlusion was impossible. The preceding molar had already been extracted by somebody early in the afternoon. Both teeth were perfectly sound. On examination, the patient showed marked signs of anæmia. In the treatment, no attention was paid to the tooth, because the trouble was not there. It lay in the malnourished nerve center, which manifested its ailment with pain at its periphery, a condition common to many troubles.

To relieve the pain, the most annoying symptom, a hypodermic injection of $\frac{1}{4}$ of a grain of morphine was given. He was then placed under tonics (iron, quinine and strychnine) and a regulated diet. The patient rapidly gained in strength and weight, his pain left him, and he has enjoyed good health ever since.

Prof. K———, a principal of one of our schools, called on me to treat a tooth, that I had capped three years before. The symptoms of death of the pulp, were so marked that I unhesitatingly and without the usual tests cut down to the pulp; but to my sorrow and great discomfort to my patient, it was still alive. On examination the patient was found to be very anæmic. I again closed up

the cavity and placed the patient under a tonic treatment. The pain subsided and the symptoms have thus far not reappeared.

These cases are not very frequent, yet sufficiently so that if the dentist is not on his guard, he will every now and then sacrifice a most valuable tooth, a damage which cannot be repaired.

Cases of calcareous and serumal deposits, and the involvement of apical troubles, as well as the different diseases of the gingivæ, have been thoroughly discussed by the profession and are not very liable to be taken for pyorrhœa by any progressive dentist.

A bacteriological examination of the pus, and of the pyorrhœal pockets, gives absolutely no satisfaction. Clinical experience seems to point to contagious qualities.

Is uric acid the cause of rheumatism, or pyorrhœa? The agitators of the uric acid cause, have never attempted to explain this question, but simply assumed it as an established fact. Where they obtained their authority, I absolutely do not know. But I do know that it is a most extraordinary claim. Persons who have made a life study of this disease, and have written volumes on its symptoms, diagnosis and treatment, say they do not know the cause. Not a single modern author on practice of medicine claims to know the originator of this ailment and all research in the bacteriological laboratory does not better things much.

Rheumatism, according to some authorities, is due to faulty nutrition; others say it is an infection and then there are a number who say it is both. As examples of diseases due to the faulty metabolism, may be mentioned, eczema, urticaria, impetigo, erythema, inflammatory condition affecting the mucous membrane of the respiratory passages, chronic acid dyspepsia, congestion of the liver, lithiasis, hæmorrhoids, neuralgia, hemicrania, congestive headaches, gout, all forms of rheumatism, rickets, scurvy, diabetes, obesity and polyuria.

Imperfect tissue metabolism as well as the oxidations of the different foods, results in the formation of the following acids and substances: uric, hippuric, oxalic, carbonic, lactic, and lactates, caprylic, caproic, valerianic, butyric, propionic, acetic, stearic, oleic, palmitic, formic, cholalic, taurilic, damaluric, damalic and succinic acids, etc. Further researches in this direction will undoubtedly reveal more.

Before considering how uric acid acts as a disease producer, a sketch of it in its normal state may not be out of place.

An analysis of normal urine, gives about the following amount in twenty-four hours :

Solids in this amount.....gr. 1,000

Analysis of the solids yields about :

Urea ($C_6H_4N_4O_3$).....	gr. 500
Uric acid	gr. 10
Hippuric acid.	gr. 18.7
Kreatin.....	gr. 18.7
Chlorides	gr. 18.5
Xanthin pigments (aromatic sulphates, and other ex- tractives)	gr. 18.5
Normal sulphates.....	gr. 30
Phosphates, earthy and alkaline.....	gr. 52*

Large quantities of uric acid crystals and urates are found in the kidneys of the new born. Yet this condition is not considered to be of any pathological significance. It is always found in small quantities in the blood and muscles. It composes a large part of the excretions of birds and amphibians. The excretions of insects are almost entirely composed of urate of ammonium. I injected a dog three times a week for three weeks with all the uric acid I obtained from a patient that furnished an unusual quantity, with no noticeable effect. The murexid test showed uric acid on the peridental membrane in two cases of sound teeth that I extracted of healthy children for the correction of an irregularity.

Patients after a fit of epilepsy, children after an attack of convulsions, and patients after a fit, have their urine heavily loaded with uric acid.

"Of all these organic acids, carbonic acid and uric acid do not by their presence increase the acidity of the tissues, since carbonic acid never exists in a state of freedom, but is always combined with bases for which it manifests an affinity; and uric acid if uncombined with bases is rapidly eliminated through the kidneys and does not manifest acid qualities."

Lactic acid renders soluble the calcareous salts and leads to diseases like osteomalacia and rickets. Oxalic acid exists in the blood of gouty, scrofulous, tuberculous, hypochondriacal, obese and neurasthenic patients. Such patients are easily fatigued, excessively irritable, unrefreshed by sleep, have an offensive breath and usually acid feces.

* Evans-Milwaukee Medical Journal. Vol. 3, P. 1.

The triphosphate of calcium of the tissues, yields two equivalents of calcium which combine with oxalic acid and the remaining acid phosphate of calcium passes in state of solution, out of the tissues, and is eliminated in the urine. Hence heavy deposits of the phosphates in the urine denotes active tissue waste.*

Here are twenty acids due to the same cause, with carbonic acid and uric acid as the least harmful, and lactic and oxalic acids balancing the other side of the scale.

Now in the face of all these facts, the man who can defiantly and positively say uric acid in and of itself can produce rheumatism or pyorrhœa, ought to readily pass for a near relative to the fellow who could hear the grass grow.

“All the acids singly and combined are not capable of producing rheumatism. In addition, exposure to cold will not produce it, although other inflammatory diseases may develop. Very often rheumatism appears as an epidemic. Clinical experience plainly indicates a hereditary tendency. It may attack any part of the body. It may involve serious complications and always leaves the patient more or less debilitated. All these facts point to another and more plausible cause, infection.

“The same is true with pyorrhœa. The acid dyscrasia, is not a cause, but like every other debilitating condition, it may be regarded one of the ætiological factors.”

Another misunderstanding is with the formation of calculi in pyorrhœa. This certainly must be a result and not a cause unless some one can prove that the formation here is altogether different from those formed in other parts of the body. Calculi are not formed unless a foundation is laid on some nucleus, a cavity, inflamed or degenerated tissue, or some foreign substance lodging at some given point around which the deposits settle. Deposits are not necessary to pyorrhœa anyhow.

During the term of my practice 170 cases of pyorrhœa came under my observation. 9 of these cases had been affected with scurvy; 14 with tuberculosis; 8 with chronic parenchymatous nephritis; 23 with obesity; 30 with alcoholism; 17 with rheumatism; 7 with chronic eczema; 4 with diabetes, and 37 enjoyed most excellent health, no constitutional trouble of any kind could be discovered.† Their average age was forty-three years. The

*(American Text-book of Theory and Practice. Vol. 2, P. 73.)

† The balance did not permit examination.

youngest patient was a tubercular lady, of twenty-three years, the oldest a gentleman of eighty-nine years, and in most excellent health.

My own statistics would indicate it to be a disease of middle and advanced life. 69 per cent were men. The average age of the men was forty-seven years, and of the women thirty-nine years. Of the 37 in which no constitutional trouble could be found, 22 were men and 15 were women. I simply give you these statistics deducted from my own practice for what they are worth, hoping that they may form a nucleus for something more reliable in the future. I sincerely hope every dentist will keep an accurate record of every case that comes to his office, and a description of all constitutional troubles that the patient may have. Then after a few years of hard work, some good fortune may grace the profession that will at least enable us to free suffering humanity from this most destructive disease.

PRESIDENT'S ADDRESS.—OUR RELATIONS TO THE DENTIST OF THE FUTURE.*

By C. H. ROBINSON, D. D. S., WABASHA, MINN.

Instead of the usual president's address, at the suggestion of the executive committee I have prepared a short paper entitled, "Our Relations to the Dentist of the Future."

Before reading the paper I wish to make a few suggestions and recommendations to the members of this association: First, in regard to membership and attendance at meetings.

There are many good men in the State who are not identified with this association, and others who are now or have been members, but who seldom attend meetings. A systematic effort should be made to reach and interest these men.

Such an effort has been made this year by both the executive and membership committees. The executive committee has not only prepared a good program and made all necessary arrangements for a good meeting, but has also spent much time and energy in getting such a display of dental goods exhibited by our best dental houses as alone should be worth the time and expense of a visit from every dentist in the State.

The membership committee has also been at work. Not con-

* Read before the Minnesota State Dental Society.

tent with simply presenting to the association such names as are voluntarily brought to it, it has invited and has urged the members to invite many of these men to join the association, or if already members to again become active in the work of the association.

Some special effort should be made each year toward this end. Let us prepare first a good program and then have a social entertainment, pleasure trip or something else of interest.

An effort was made this year by the twin cities to induce the American Dental Association to meet at the lakes next year. As I understand, this did not succeed; suppose we try to arrange an interstate meeting or even hold our own annual meeting next year at one of the lake hotels. Then let every member from the twin cities move out to the lake for the entire three days of the meeting and let those from other cities bring their families with them and enjoy a few days outing. Arrange a half day of field sports, boat races, bicycle races, or anything for a good social time.

It would give us more opportunities for cultivating one another's acquaintance, and we all know that in attending a dental meeting we receive nearly as much benefit from the little side talks between sessions as from the papers and discussions themselves.

Something should also be done to avoid the necessity of holding a special meeting each year for the purpose of selecting names to present to the Governor for the appointment upon the State Board of Dental Examiners.

As the law requires this association to present these names before August 10, and our annual meeting does not occur till September it is necessary to either hold a special meeting or select the names nearly a year before the vacancies occur.

The holding of a special meeting for this purpose is, I think, an injustice to our members from the smaller cities as it necessitates the expense in time and money of an extra trip to the twin cities. We should either change the time of our annual meeting or get the legislature to change the law.

There should be also an effort made to have an act passed exempting dentists from jury duty, not that I should wish them to shirk their responsibilities to the communities in which they reside but that I believe their greatest responsibilities are in the line of their profession.

The following persons are exempt from jury duty in this State: All members and officers of the Legislature while in session, all

United States officers ; all judges of courts of record ; commissioners of public buildings ; auditor and treasurer of State ; clerks of courts ; registers of deeds ; sheriffs and their deputies ; coronors, constables, attorneys and counselors at law ; ministers of the Gospel ; preceptors and teachers of incorporated academies ; one teacher in each common school ; practicing physicians and surgeons ; one miller of each grist mill ; one ferryman to each licensed ferry ; all acting telegraph operators ; all members of companies of fireman organized according to law ; all persons of more than sixty years of age ; all persons not of sound mind or discretion ; persons subject to any bodily infirmity amounting to disability ; all persons unable to speak and understand the English language ; old soldiers ; militia men during service ; honorably discharged militia men who have served five years ; registered druggists ; and in local district courts the county commissioners and other officials of Hennepin County ; mayor, aldermen and school directors of Minneapolis ; and the mayor and other officials of the city of St. Paul.

Now with ministers and lawyers, physicians and druggists exempt, besides the other persons mentioned, it seems to me that whether or not we consider our profession a specialty of medicine, we should ask the people through their representatives to recognize our usefulness by exempting us from a duty which might involve great hardship not only to ourselves but also to our patients. With these suggestions I will pass to the subject above mentioned.

OUR RELATIONS TO THE DENTIST OF THE FUTURE.

What can we members of the Minnesota State Dental Association and practicing dentists of the State of Minnesota do toward improving the dentist of the future, more directly in our own State, but also indirectly throughout the profession at large ?

First, in the selection of the material. We have young men coming to us for advice in regard to studying dentistry. We should advise them invariably to finish their high school course or secure an equivalent education before beginning the study of dentistry. This is the requirement for admission to our own university, and if we individually recommend the same it will not only help our home institution, but also make it easier for other colleges to adopt the same requirement.

We should also consider their mechanical ability and natural fitness for the profession. The requirements then should be a

sound mind in a sound body, a high school education or its equivalent, and a certain amount of mechanical ability.

Then comes the question, should we advise a student to spend some time in a dental office before entering college? Some of our best teachers say that they prefer students who have had no office experience, but it seems to me that a young man entering upon the study of dentistry should have a better idea of what the practice of the profession is like than can be obtained from a patient's standpoint. Too many young men are attracted toward dentistry by the size of the dental bills which they pay, and some of them, after spending three of the best years of their lives and from \$1,000 to \$1,500, find they have made a mistake, that nature did not intend them for dentists.

Had they spent sufficient time in a dental office to obtain a general idea of the profession from the dentist's standpoint, it might have saved them much time and money.

In recommending a dental college to the student, while it is to be expected, and in fact is commendable that we should think highly of our own Alma Mater, yet I think it the duty of every dentist in the State to recommend the dental department of our State University. I do not say this simply because it is a home institution, but also because I believe it to be one of our best colleges. It would be advisable for us to keep as well informed as possible on what this college is doing and teaching.

If we have any suggestions or criticisms to offer, let us go frankly to the faculty with them; and I believe they will be met in the spirit in which they are offered. We cannot help build up our home institutions by casting slurs or insinuations against them.

We know that there is room for improvement in the method of teaching in all our dental colleges. I believe that none realize this more than do the teachers themselves, and as a body they are striving earnestly for better methods.

There is not as much uniformity in teaching among the different colleges as could be desired, nor do the different teachers of the same college always agree. While there will always be honest differences of opinion, still it is not conducive to the best results to have a demonstrator teaching methods directly contrary to the instructions of the professor of his department, nor to have

one professor trespass into another's field of instruction with entirely different views on the subject.

It has seemed to me also that some better method could be devised for teaching certain subjects than to have the professor fire lectures at long range at a large class of students, with only an occasional quiz or examination.

Many a lecture has gone entirely over the heads of the students, or has even fallen short of reaching them ; and all because the teacher was not in touch with his class and did not know how much of the pabulum fired at it had been digested and assimilated.

This is an age of printer's ink, and I believe there is a need for better text-books and more old-fashioned studying and reciting. Let the teacher have his lectures printed and placed in the hands of the student ; or prepare an outline or syllabus of each lecture with reference to pages or chapters of certain text-books to be studied, then spend less time delivering the lecture, and more illustrating it and finding out how much of it the class has learned.

But it was not my intention to write a paper on methods of teaching. I simply wish to emphasize the fact that our colleges cannot pursue an advanced course of teaching unless there is a healthy favorable sentiment throughout the profession at large. If we send all our students to low grade colleges with low preliminary requirements we certainly will not advance our profession.

We have one of the best dental laws of all the States of the Union, and we should help to keep it so, and to see that it is properly enforced, for this is one of the most important means of influencing the future of our profession in this State.

The board of examiners has done good work, and deserves our support. We should try to keep in touch with it, and let it know that it has our support, not by a blind approval of all it has done or may do, but by advising with it and helping to make its work as efficient as possible.

We should be particularly careful in selecting names to present to the Governor for appointment upon the board, that it may always consist of good representative men of the profession.

As the younger members of our profession come into the State or settle among us let us try to interest them in our State association, and there is no better way to do this than by giving them something to do.

There is nothing like working together for a common cause that will bind men together and keep them interested in one another.

In conclusion, ladies and gentlemen, if we will set aside all petty discords and improve our opportunities for advancing our profession, with the start we now have there is no reason why Minnesota should not ever keep in the vanguard in the advancing army of dentists, and we be able to leave priceless legacies to the dentist of the future in our dental law, our dental college, our State and local dental societies, but above all else in that fraternal spirit which will be found to pervade the profession everywhere throughout the State.

COAGULATION.*

BY A. W. HARLAN, M. D., D. D. S., CHICAGO, ILL.

The title of this paper is intended to cover only that form of coagulation which may be followed by a coagulant coming in contact with the albuminous matter present in a freshly extracted living tooth or one containing a dead pulp.

The subject of the diffusibility of drugs in teeth was presented to the Iowa society some years ago in 1890 at Dubuque† by the writer. Those experiments were made with some of the oils, carbolic acid, creosote and zinc chloride. To-day I will present a few recent experiments, made in a different manner. Selecting a freshly extracted tooth just as it comes from its socket, the pulp chamber is opened and the pulp is removed. The interior of the root is dried. The apex of the root is filled with gutta-percha, to prevent leakage through the end of the root or roots. A paste of starch is built up around the root to the junction of the enamel. Zinc chloride liquefied with water is introduced into the canal on cotton. It is allowed to stand twenty-four or forty-eight hours. The cotton is then removed carefully with a pair of platinum pointed pliers. A drop of the tincture of iodine (officinal) is introduced carefully into the pulp chamber. At the end of twenty-four hours or forty-eight hours the starch is carefully detached from the sides of the root. If the iodine has passed through the dentine and cementum we will at once see iodide of starch as the

*Read before the Iowa Dental Society.

†See DENTAL REVIEW, July, 1890.

result of such diffusion. In not a single case have I observed such penetration. Zinc chloride is soluble in water and alcohol. Iodine is soluble in zinc chloride. The coagulation of the contents of the tubes by zinc chloride is a barrier to the passage of iodine through the dentine and cementum. All the teeth used for this purpose were adult teeth obtained from Dr. J. W. Slonaker, a specialist in the extraction of teeth with nitrous oxide. A number of teeth were prepared in the same manner and carbolic acid (melted) was introduced into the pulp chamber very carefully to avoid getting any of the acid in the crowns or on the outside of them. After the lapse of twenty-four and forty-eight hours respectively, iodine tincture was introduced in the same manner as first described above. If the iodine penetrated the dentine, it would pass through the cementum and turn the starch blue. It did not penetrate, hence no blue stain.

Iodine is soluble in carbolic acid. Carbolic acid is soluble in alcohol. Both are coagulants. Carbolic acid is sparingly soluble in water; iodine is soluble in water, about 1 to 7,000 parts. This is one of the best experiments that could be used as a test for diffusion.

Repeating the above experiments with wood creosote for the same length of time we find the same results; no stain, only slight discoloration of the dentine showing that the iodine did not pass through it. Iodine is soluble in creosote. Creosote is a coagulator of albumen. Creosote is soluble in alcohol, both are coagulators of albumen.

Another series of experiments was made with tincture of iodine alone. The results were negative. The iodine did not pass through the sides of the root. If a foramen had been found on the side of the root, we would have expected the tincture to pass through it. We did not find a single tooth with any extra foraminal opening. What do these experiments prove?

It seems to me that they fortify the position taken some years ago that coagulants as used by dentists in the roots of teeth set up a barrier to their diffusion through the dentine as long as there is any coagulable material in the dentine tubes. If the dentine is drilled out with reamers and burs until practically none of it is left, we might get a coagulant to penetrate the cementum. It is not considered good practice to so ream out a root and hence it is not practiced generally. Corrosive sublimate is soluble in water to a

very limited extent and when brought in contact with albumen a new compound is formed, albuminate of mercury, which presents the further penetration of (HgCl_2). This is an effectual barrier to its passage through the dentine. A tooth that has long been pulpless does not lose all of its animal matter from the dentine tubes. Even if it did, constant bathing of the roots with saliva would, and does fill the open ends of the tubes, so that there is albuminous matter between the ends toward the canal, as is shown by the sodium and potassium treatment of Schreier. It is this form of fat and albuminous matter that permits of the saponification of the contents of putrescent pulp canals and putrescence itself in the root.

After such a dressing has been applied, or any other dressing; as pyrozone or hydrogen dioxide the application of a coagulator will prevent its own diffusion through the sides of the roots so treated.

What is a coagulum? Here is the latest definition.

Coagulum, *coagulare*, to curdle, clot. The mass of fibrin, including red and colorless corpuscles and serum, that forms from the plasma of the blood, after the latter has been drawn from the body. Also the curd of milk and the insoluble form of albumin. —(Gould.)

I will recapitulate a few of the experiments made in former years. Freshly extracted teeth were taken, and the pulps removed when present. The apices of the roots were filled and the teeth planted in plaster of Paris. A piece of cotton being moistened with the coagulating agent, was carefully packed in the root, leaving the crown dry. At the end of one day, two days, and even as long as forty days the drug was allowed to remain in the tooth; from time to time, the plaster of Paris surrounding the root was moistened so as to keep it wet for examination. I was never able to discover a trace of carbolic acid, chloride of zinc or wood creosote, the three coagulators used in this series of experiments. Reversing these procedures and using oil of cassia, oil of cinnamon, cloves, eucalyptol, eugenol (pure) oil of sinapis, oil of cajaput and a number of others, I could, after seven hours find that the oils had passed through the sides of the roots. In some cases it required from fifteen to twenty hours. By adding carmine, and some of the analine dyes, we could note the passage of the staining agent when used with the oils. One of the tests that I consider a fair one was

to take a tooth, clean out the root, fill the apex with gutta-percha, introduce the drug and then suspend it in egg albumin. If the tooth was intact (not cracked) no coagulating agent that I am acquainted with will pass through such a tooth, not even nitrate of silver. This will furnish its own discoloration. I will refer you to recent papers of mine published in the *Dental Cosmos* for March, 1895, and in the *DENTAL REVIEW* for April, for further evidence on this subject. Before closing I would like to say that the use of noncoagulating agents for the treatment of roots containing or having contained putrescing pulps has been advocated by me for more than fifteen years on the basis that such agents were true sterilizers of poisonous matters lodged in hard tissues like the dentine. Recently this has been questioned by Drs. Truman and Kirk, of Philadelphia, who say that the dentine is permeable by coagulating agents. Their experiments are not conclusive, they were faulty in the extreme and we must conclude until further evidence is presented that coagulants are barriers to their own diffusion through the dentine and cementum of a tooth. Dr. C. Heitzmann says that he doubts very much if a coagulant can pass through a canaliculus. I agree with him, although I was the first to point this out. If a canaliculus is empty the agent may pass through, I doubt very much if it will pass through the cementum when the tooth is implanted in its socket. You need have no fear of causing a tooth to drop out, by using any powerful coagulator of albumin in the root when the apex is closed with an impermeable root filling.

PREPARATION OF CAVITY MARGINS.*

BY E. B. WEEKS, D. D. S., LITCHFIELD, MINN.

The time was, but now we hope is passed forever, when there was no definite instruction given as to the lines on which a cavity margin should be formed or how much or how little the enamel walls should be cut away with reference to precluding future recurrence of decay.

Remove decay. Cut away frail walls. Bevel the margins. These were the few but elastic rules for the preparation of all cavities, and as ascertained from the writers in the journals, from speakers at our society meetings, and by observation of fillings

* Read before the Minnesota State Dental Society.

coming under our notice, these rules meant very different things to different operators. A cavity cleansed of decay by one operator would not be considered thoroughly excavated by another.

One would leave enamel walls for retention of the filling, while another would know that the retention of such frail walls would be the ruin of any filling within a very short space of time.

Enamel margins were considered beveled by some, while others would go a great deal further. But thanks to Dr. Black and others we have now a system of definite laws as to the preparation of cavity margins and enamel margins, how much the walls should be cut away, how much the enamel should be beveled.

It is the belief of the writer that it is absolutely necessary to the stability of a filling that these laws be both understood and *carried out* in every cut of the chisel. It is also my observation that, present company always excepted, these laws are not carried out in the everyday practice of the rank and file of our profession. The first requirement is a knowledge of the minute anatomy of the teeth, and of the lines of cleavage of enamel. Then the first rule should be: Cut away all enamel margins not supported by sound dentine. The wish to keep a frail wall of enamel for a retaining wall must give way to the fact that it will not stand, therefore cut it away.

Second. If the line of the margin of the cavity brings you close to the line of demarcation between the lobes of the teeth, cut through to, or beyond such line, for it will prove a source of weakness to your filling if you don't, because of the greater liability of the enamel to split along these lines.

Third. Cut away the margins of the cavity clear beyond the lines of contact on the teeth. Let nothing deter you from doing this, for if the line of union between the filling and the enamel is at or within the line of contact, recurrence of decay is almost certain sooner or later.

Again, carry the cavity margins cut to such a place on the surface of the tooth that the fillings may be smoothly polished and beautifully formed. Do not cut into a developmental groove and then stop short of the end of it.

Do not cut next to a groove or to another cavity and stop there, leaving a thin division of enamel between them, but cut it away.

Having formed the cavity margins on the lines indicated, it

remains to bevel the enamel margins. The enamel should be shaved or planed down with sharp chisels to that line on which it splits or cleaves off most readily, then with enamel trimmers the margins of this enamel should be beveled *beyond* this line so that the ends of the enamel rods may be protected by the filling. It is impossible in a paper like this to demonstrate just what this bevel should be at each particular part of the tooth or cavity, but must be learned from close observation of the lines on which the enamel cleaves at each different portion of the tooth, and by following the teachings of Dr. Black, whose writings and admirable illustrations are open to each one of us, a heritage of vast value to us all.

Dr. Ottolengui, in his book on "Methods of Filling Teeth," after rehearsing what has been accomplished in the past, says: "Something more will be required of the dentist of the future. He will be asked to abandon the assertion, 'Madam, your tooth has decayed around my filling, *but the filling was all right.*'" Undoubtedly there are teeth in which it is impossible to prevent recurrence of decay, but it is equally true that in too many cases when "the teeth decays around the filling," the filling was *not* "all right."

Gentlemen, if this paper excites you to thought and discussion on this subject, its object will be accomplished.

SURGICAL CLINICS.

REPORT OF PROF. TRUMAN W. BROPHY'S WEEKLY CLINIC IN ORAL SURGERY, AT THE CHICAGO COLLEGE OF DENTAL SURGERY, NOVEMBER 13, 1895.

REPORTED BY R. C. BROPHY, M. D.

Case 1. Infant son of J. H. D. Age eight weeks. In this case, gentlemen, we have as you see a harelip. You will notice that the lesion is upon one side only, the left side; that while it extends into, it does not completely divide the maxillary bone at its anterior border, and that externally it does not extend upward sufficiently to involve the nostril. You will classify it, then, as a single, partial harelip.

Upon examination of the palate and velum we find that they are perfect in formation. Prominent men in the profession have

asserted, and it may be found on record in our literature, that hare-lip never occurs unless accompanied by cleft palate. This case, however, as well as five others upon which I have operated, proves conclusively that those who hold such views are in error.

The method of surgical procedure which presents itself in this case is to make an incision in such form as to produce two flaps from above downward, which when brought together will produce a temporary protuberance at the point of junction. This protuberance will, as the process of cicatrization takes place, project sufficiently to form a straight line along the border of the lip, thus avoiding the leaving of a notch, so commonly seen after operations of this kind. Care must be exercised when approximating the tissues, to the end that the line of union between the skin and mucous membrane shall be so approximated that one will not lap upon the other; the skin upon the mucous membrane, or vice versa.

Objections have sometimes been made to the use of pins in holding the parts in apposition in these operations; but I have found them very efficacious in holding the parts in a quiet state until union is effected, and while I am willing to admit that there are well grounded objections to their use, yet my own experience has convinced me that the method has sufficient real merit to warrant me in continuing their use in certain cases. After the introduction of the pin the figure of eight suture is made use of in bringing the parts together, and then a nice approximation of the flaps is made by the use of silk sutures. In this case we will make four stitches; two externally through the skin, and two through the mucous membrane on inner surface of lip. In more extensive cases two pins may be used, and narrow strips of adhesive plaster may be employed as auxiliaries to the sutures.

In the case before us a simple dressing of powdered boracic acid only is called for.

NECROSIS OF INFERIOR MAXILLA.

Case 2. J. H. N., of Chicago. Restaurant waiter; age thirty-three years. This case furnishes us an extraordinarily valuable clinic for the reason that the unusual condition exists of almost complete destruction of the lower jaw. At least I find that a necrosed condition exists from the left ramus around to and including a portion of the right ramus. Upon opening the mouth, and

deflecting the lip, we find that the soft parts covering the bone have sloughed away, and that the bone is exposed to view from the alveolar to the lower border, thus exposing the entire anterior surface, as well as the buccal surfaces as far back as the rami.

A careful examination reveals the fact that a portion of the periosteum has been preserved upon the lingual surface of the bone, and that secondary osseous tissue is being formed. It is unnecessary for me to remind you that when necrosis of the entire inferior maxilla takes place, or the body thereof, a marked deformity will result unless a sufficient portion of the periosteum be preserved from which new bone will be produced; happily in this case a small fragment of periosteum still remains intact, and even now nature is at work at reconstruction, and though complete rebuilding of the lost structure under existing circumstances is a herculean task even to nature, yet there is every reason to believe that the maxilla will be sufficiently reformed to restore the contour of the features and establish a foundation upon which an artificial denture may be supported.

It will be of interest to you gentlemen to know first, in describing this case what may have brought about this extensive destruction of bone. Necrosis as you have learned is destruction *en masse*; it is analogous to gangrene, while caries is a molecular destruction of bone, analogous to ulceration of the soft parts. This patient claims that his first discomfort was caused by a diseased molar upon the right side, which tooth was broken off in an attempt at extraction, though the roots were subsequently removed, etc. I do not doubt that the disturbance blamable to the tooth may have been the exciting cause of the inflammation which terminated in the sloughing and destruction of the bone, but this local disturbance was in my opinion augmented by the low vitality of the patient due to specific disease.

Examination further shows that the line of demarcation between the living and the dead bone has formed, and that nature is doing its utmost to cast off the devitalized tissue. Our duty then is well defined and plain, we must come to the assistance of nature in removing this sequestrum, this now foreign substance which already is loosened almost completely from the living bone. The patient being etherized then we will remove the necrosed body of bone, after which we will carefully examine the cavity that no spicula or fragments remain, that the edges of the living bone

be left smooth. We will then proceed to pack the cavity with carbolized or boracic gauze. This packing may be discontinued after a couple of days; cleansing antiseptically at least twice each day must be required until the healing process is so far advanced that all danger of infection is passed.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

Regular meeting December 3, 1895, the President, Dr. W. V.-B. Ames, in the Chair.

Dr. C. N. JOHNSON read a paper entitled, "A Method of Anchoring Large Contour Fillings in Incisors."

DISCUSSION.

Dr. A. H. PECK was called upon to open the discussion.

In opening the discussion on this paper I shall have very little to say, because there is very little left to be said. Dr. Johnson has presented the subject in such a way that I can find nothing in the subject matter of his paper to disagree with, consequently, I can say but very little upon it. There are one or two things I want to speak of. The first is, you will notice that the essayist has not gone to extremes in considering this question. He confines this sort of anchorage to a certain class of cavities, not advocating that all large contour fillings in incisors shall be anchored in this manner, and he has to my mind made it sufficiently clear, so that we need not spend time to enlarge upon that phase of the subject. But the class of cavities for which he has advocated this sort of anchorage, I must say that I have used the same method ever since I have been in practice, and consider it the only way to anchor permanently this sort of filling. As he has said, if the anchorage ends at the incisal edge, between the two plates of enamel, labial and lingual, the gold is liable to be loosened at the incisal edge from the force of mastication. I have seen a great many fillings anchored in this manner which have loosened, and no doubt you all have. Take an incisor tooth where the proximal surface is wasted away by the carious process and the tooth approaching the incisal edge is very narrow, as they often are, from the labial to the lingual aspect, it seems to me that there is

no other method left to employ, if we wish success with the operation, except to extend it along the incisal edge and anchor in the manner indicated by the essayist. I might say at this point, that in just so far as the operator fails in his judgment in the selection of cavities to be anchored in this manner, in the very same ratio is he a failure as an operator in this particular.

I want to emphasize this point as to the manner of anchoring these fillings. The essayist has already told you that the anchorage in this case (illustrating) is so far removed from the incisal edge that it cannot possibly do any good in the direction of holding the plug at that point (illustrating). We want strength and stability. Here (illustrating) is where force is applied, and there is where the operation will fail; hence the anchorage should be at the incisal edge which receives the force of mastication. There is where the strength must be. I can conceive, I think, of cases where this sort of anchorage (illustrating) would suffice if the tooth is naturally a large, thick, strong one—wide or thick rather from the labial to the lingual aspect clear to the incisal edge, so that the body of gold at that point is sufficiently large to withstand the force of mastication exerted upon it. In such a case it may not be necessary to extend the anchorage along the incisal edge of the tooth. Some may advocate screw posts for anchorage at this point instead of extending across. I have used them more or less. I have seen other operations in which they have been used for the purpose of anchoring fillings. I have found them to be insufficient in many cases. So I believe the best plan of anchoring the class of cavities that have been illustrated by the essayist is the method which he has advocated.

Another point. In cutting the anchorage at this point (illustrating) of the tooth, the essayist has also said we are liable to approach so near to the pulp of the tooth as to cause at first a slight irritation, and this irritation will continue and finally result in death of the pulp. A great many of these teeth are narrow at that point and oftentimes the bulbous portion of the pulp extends to the incisal edge, so I cannot see any advantage in using that form of anchorage for this class of fillings.

Dr. YOUNGER, of California, was asked to speak, and he simply said that he fully agreed with Dr. Johnson and with the remarks of Dr. Peck.

Dr. GEORGE H. CUSHING: I am glad Dr. Johnson has pre-

sented this subject in the way he has. Comparatively few dentists have understood the proper method of anchoring these fillings, and it is the proper method because it is based on absolute mechanical principles, and that is what should govern us in the preparation of cavities for fillings in all teeth where the fillings will be subjected to strain. The square base and the square steps, whether one or more, that are made in the preparation of cavities, are the essential features in governing the strength of a filling of this character. I would go a little further than the essayist does. Probably I am what you would call an extremist in the matter of filling cavities of this character. I should always in all of these cases cut away the incisal edge of the labial plate of enamel, so that the gold would overlap perhaps the fiftieth of an inch in thickness. If the gold is carried over the labial plate of enamel, that will be perfectly protected against the force of occlusion. I would sometimes in the preparation of a case like this make two steps, one half way perhaps. Of course, each case is to be judged individually, but I cannot say any more than the essayist has said, nor say it half as well.

Dr. J. N. CROUSE : There is a feature of this operation which I think, carried to the extreme, makes it objectionable. I should prefer in a young lady's mouth, if the chances were fairly good, not to cut across the cutting edge of the central incisors or lateral incisors. I think when you go across the ends of these teeth you must protect the enamel, and that you are in danger of the accidents of which Dr. Cushing spoke. You expose to view the gold on the front end of the tooth which gives the patient a more or less unsightly appearance. I dislike very much to see the gold exposed on the ends of teeth, particularly in ladies mouths. It does not make so much difference in the average man who uses tobacco, or has a mustache large enough to cover the gold.

As to the other part of the operation, the essayist speaks of avoiding the gold showing through the enamel. There is a large percentage of cases where the teeth are thin, and it is next to impossible to get anchorage without having the gold shining through. In that class of cases, where the enamel is thin and clear, the gold will shine through. I have performed the operation many times, and after it was completed I was sorry I cut across there because the gold showed to the end. I remember operating on one of Dr.

Cushing's front teeth, first fixing it, running across the end, and the gold presented itself to me and reminded me of something that I would like to have out of the way if I could.

Dr. T. W. BROPHY: The objectionable feature mentioned by the last speaker may be in a measure removed by the combined use of gold and platinum, and I do not think there is any member here who has used it more successfully than Dr. Crouse. If the gold and platinum be selected with care to correspond to the color of the natural tooth as nearly as possible, the feature he has named will be in a great measure overcome, and I think it is always wise in these cases, such as have been shown on the blackboard, and in the case of the model, to make use, especially upon the surface of platinized gold. Our good friend, Dr. McKellops, of St. Louis, is an enthusiast on this question, and every one who knows him, knows that he is an unusually fine operator, and that whatever comes from his hands is a work of art. In some of the fillings he has inserted, his selections have been such that he has been able to match the color of teeth with a degree of exactness that is not to be approached by anything else in the way of gold or any cements that have been as yet brought forward.

I approve of the operator's method. If this method can be carried out as Dr. Johnson advocates, and not carried to an extreme in any particular case, used with judgment, as every operation in dentistry must be performed, the best results can be secured. I do not think any practitioner of dentistry with good judgment would attempt to cut off the edge of a tooth where it did not seem absolutely necessary in order to impart strength to the filling. If it were a question of giving strength to the filling and not cutting deep into the substance of the dentine, I think it would be wiser to cut along the border, and in these cases there is always by wearing down of the edges a little groove left along the cutting edge, so that I think the cutting in such cases is always justifiable. Even when the enamel is thin at the cutting edge, as it sometimes is where undercuts are made by another, we have nothing left but a thin wall of enamel that will break off, and it is only a question of time when the dentist will be forced to do what he should have done in the first place—cut along the edge and make a cavity of the proper form. In the first place he did not use good judgment. He tried to do what

was impossible. I do not see how any one, who has had a large experience in the management of such teeth, can take opposite views to those of the essayist. There might be cases where it would be unjustifiable to do this, and that is where judgment comes in. It is judgment that makes the difference between the successful and unsuccessful practitioner.

Dr. J. W. WASSALL: I wish to add also my word of praise to Dr. Johnson for bringing forward this manner of anchoring gold fillings in the class of cases that are adapted to it. I could not help but think, however, as the question was being discussed, that there are a great many cases where this method of attaching a filling is desired when it cannot be used. I refer to teeth that are thin at the incisal end, those Dr. Crouse has already spoken of—so thin, in fact, that there is no dentine at the incisal edge for one-eighth of an inch or more, the two plates of enamel coming in apposition. It would be impossible in such cases to cut away the lingual plate and get any anchorage. You cannot reach dentine unless you cut away farther than would be justifiable. I think that even in the most favorable cases for it, it would be advisable to rely mainly upon making deep anchorages at the cervical portion of the cavity.

Dr. Johnson is doing good in emphasizing this method of attaching fillings in particular cases, but I do think he makes the rule a little too general in its application.

Dr. ISAAC A. FREEMAN: There are one or two points that might be emphasized still further. I think this same topic was up before the State Dental Society at Bloomington. Dr. Cushing advocated the same general plan. But we have here in the tuberosity of the tooth, an opportunity to gain great support for the filling of this and all class of cavities in the incisors. What occurs to me is that the representation on the blackboard may not be just exactly as the writer referred to intended to represent in his criticism of Dr. Johnson's formal paper. This method can certainly be employed in many cases, as, for instance, in those cases where there is no dentine between the enamel plates for a considerable distance from the cutting edge. We may at the point of union lay open the lingual surface, and use the method set forth on the board. The method might be employed advantageously in those cases where if you cut across the cutting edge you would weaken the labial plate, and which most assuredly would result in

wasting of that plate. For when the full force of mastication is exerted upon the enamel plate it will give way, unless you first remove the plate and reinforce it with the gold. Dr. Jack in the American System of Dentistry takes advantage of the labial plate, by its being convex in form upon the labial surface and concave upon the opposite surface. He cuts into tuberosity of the tooth so as to gain a deep groove or pit. Beneath the labial plate he forms a continuous groove, then he has support. For this free cut into the tuberosity, being away from the pulp does not threaten its life, and lines ramifying from that to the labial plate groove gives considerable support all the way up. He depends very largely upon that, and suggests it in all large cavities in incisor teeth. I have in mind several cases where I have observed this kind of operation suggested by the essayist from other operators than myself, where the enamel plate has been shattered, left standing, and being cut away freely upon the lingual surface, and after standing in that way for a time the labial plate has been shattered, portions breaking out, reaching high up on this plate. Some have suggested drilling, somewhat at an angle toward the cervix point across the tooth at the union of the labial with the lingual plate and anchoring at that point.

Dr. JOHNSON (in closing): There are two or three points I want to bring out in closing, and one is in regard to the failure of this labial plate. I have operated in this way a great many times, and I cannot recall one failure of the labial plate. In every instance, after the preparation of the cavity, the labial plate is beveled, and if I take pains with any part of the operation it is in the condensation of gold or platinum and gold over that bevel. If average caution is taken as to the occlusion upon the tooth it will protect the wall. It is beveled, as illustrated here by the model, and also by the case shown in the mouth. I was more apprehensive in the early stages of my use of this method of that labial plate than of any other point of the cavity. It caused me to be very cautious about beveling in this direction (illustrating) and building gold over in this way, so that the gold protected it. In the many cases I have had the privilege of seeing after operating on them, I have yet to see one where the labial plate has broken down. I do not have the trouble mentioned by Dr. Crouse of the gold showing through. I do not know of any case I have operated on in that way where anybody at a distance of two or more feet could tell

that there was any gold under the labial plate. If the point of the tooth is too thin I would cut away the lingual plate freely rather than make the labial plate thin, or rather than bring the gold over the end and have it show.

As to platinum and gold, I am in favor of it, and have used it in a great many cases. In regard to Dr. Wassall's point as to anchoring the filling firmly at the cervical margin, this should be done. Good strong anchorage should be gained at this point, but even the strongest anchorage possible at the cervical wall will not always sustain the filling against tipping away at the occlusal portion when force is applied, as it usually is, at that point. In anchoring fillings, the nearer we get the anchorage to the point where the dislodgment force is applied the more effective will be our work.

Dr. J. N. CROUSE read a paper entitled, "Some of the Greatest Needs of the Profession." The following is an abstract of it :

1. To improve the condition of three-fourths of the dental profession who never associate with the balance of their fellows. Next, the improvement of the condition of those entering the profession. One of the most unfortunate things which can happen to a young man is to get in a wrong channel in life, thus take up a life occupation for which he is by nature unfitted. A school of examination which would take young men, analyze them and discover for what they are best fitted, would be one of the greatest boons to humanity. In the absence of such a plan for examination, Dr. Crouse thinks that this duty in our profession must be thrown upon the colleges themselves, as they alone come into sufficiently close contact with the young men who enter to judge of their fitness. Therefore, the first six weeks or two months of the freshman course should be used to ascertain whether the students have the qualifications which will fit them for the responsible duties of a dentist. This examination should be conscientious and unbiased by the consideration of fees or the size of the class. After sifting out those who are unfitted by nature, the class remaining should have all the benefits to be derived from complete outfits, and instruction from a sufficient number of competent demonstrators. When they have taken the three years of instruction there are few of them fitted to practice their profession in the community without further experience and training. At present

the much needed school for this instruction does not exist, and therefore their only chance is to go with some practitioner of experience, and with from two to five years of instruction and practice under a capable dentist they will be enabled to practice independently with a fair degree of success. A post graduate course of some kind, the speaker thought, was absolutely essential, and he believes a plan will be worked out in the near future that will supply this needed requirement.

The next reform is that necessary in dental journalism. Just how this reform could be effected it was not altogether clear to him. The present conditions were as follows :

There are eleven monthly journals and six quarterlies, and with but very rare exceptions, each is a rehash of the others. Furthermore, this rehash is usually made up for the most part of society proceedings, and sometimes in a very ingenious way. For instance, after the full proceedings have been printed in one journal, another will print the articles as if they were original, giving neither the first journal nor the society any credit, this being repeated until the author himself cannot tell when or where he made those remarks. When an original article that is sent direct to a journal appears, it will be copied and recopied by different dental journals for five or six months. All the matter of value that is contained in the dental journals each month could be condensed into twenty-five or thirty pages. The aggregate expense of all these journals is over thirty dollars, so that very few dentists would care to subscribe for them all, and the fact that there is so much stale and worthless matter has brought about the result, that it is a rare thing to find a dentist who reads any one journal thoroughly, or even pretends to know what is in the journals. Were it not for the proceedings of dental societies several of these journals would have no material with which to fill their pages. To the profession they were of no earthly use from an educational standpoint.

How are all the evils to be remedied? By active coöperation. By banding the profession together in such a way that each participant is benefited in proportion to what he does. The societies, many of which have been in active operation almost as long as dentistry has existed, have failed to enlist but a small proportion of the dental profession. The benefits accruing from these organizations do not enlist their support. But

there is an organization now in existence which, if actively pushed, can do more to band the profession together and be the means of getting active coöperation than all the other influences combined—the Dental Protective Association.

Dr. J. G. REID, in opening the discussion, said he was more than ever convinced by observation from year to year that the period of three years was not sufficiently long to educate a man as a thorough dentist. The student did not get the training absolutely necessary to make a good dentist in the time prescribed. The speaker based his opinion on his experience with college work in the last three years. The colleges would do more good were they to accept a less number of students, as a class of twenty-five could be educated to better advantage than one of 150. The way to rid dental colleges of poor material, or to reduce the number of students, was to either demand a rigid preliminary examination, or to increase the fees.

As to dental journalism a reformation was very essential, as there were too many dental journals publishing the same articles and society proceedings from month to month. There was a place for dental journals which gave their readers original contributions from month to month.

Dr. C. N. JOHNSON dwelt upon the point of selection of young men who, with proper training, would make good dentists. After having had a little experience in college teaching, he could not agree with the essayist that a teacher could tell at the end of two or three months whether a young man was going to be a good dentist or not. It was his experience in some instances that the young men who seemed awkward and less promising at first proved to be the most competent both mentally and physically in the end.

With reference to dental journals, his journalistic experience had taught him that it was the easiest thing in the world to criticise a journal ; but it was exceedingly difficult to rectify the evils that are existing. We had been promised time and again all sorts of reformations in dental journalism, but in the speaker's opinion we had not as yet reached the ideal dental journal. The criticism raised relatively to those dental journals that subsisted principally upon the articles and proceedings copied, without credit, from the more reputable ones was just, and the practice could not be too strongly condemned.

Dr. FRANK H. GARDINER agreed with Dr. Johnson that it was hard to tell at the end of two or three months whether a student would be a successful dentist or not. He favored raising the standard of preliminary requirements.

Dr. C. E. BENTLEY expressed himself as having implicit confidence in the men who had the education of youthful dentists in their hands. The profession and its institutions had made rapid progress since he had graduated, and just in proportion as the profession advances, so would the dental colleges.

While his experience with dental journalism had not been large, he thought the journals were as good as the profession would permit them to be. The dental editor depends upon the profession for pabulum with which to fill the pages of his journal, and if the profession could not and did not furnish it, how could dentists expect an editor in turn to give it to them.

Dr. LOUIS OTTOFY believed the dental profession was advancing as rapidly, if not more so, than many other professions, and the colleges were likewise progressing. One of the preceding speakers had advocated a reduction in the number of matriculants and an increase in the fees. This had been done. The American College had limited its list of matriculates to 400. It had rejected this year over fifty students. He saw no reason why this could not be advantageously done.

Dr. I. A. FREEMAN said the profession had undergone in the past what might be termed a condition of robbery. Twenty-five years ago it was in the toils of one of the worst monopolies the country ever knew—a monopoly that robbed the profession right and left—as a result of which there had arisen, through the efforts of Dr. Crouse, the Dental Protective Association. It was advantageous for every member of the profession to become a member of the protective association. The profession at large were the beneficiaries of the association, hence every member should give Dr. Crouse the support he needs in his undertakings.

Dr. J. H. WOOLLEY said the reason why our dental journals were not better was because contributors to them did not furnish the right kind of material. Societies should reorganize for the purpose of doing more effective work in the direction of giving clinics once a week or twice a month that will cover the whole range of dental practice. This would be the means of stimulating the dentist to do better and perhaps original work. In order to

accomplish this it is absolutely necessary to secure coöperation and unity of effort. He would like to see an editor with sufficient backbone to reject the verbose and worthless remarks that were made sometimes in dental societies in discussing papers. It seems to him that a syllabus of the subject matter of each paper should be furnished members in advance of the meeting, so that they would come prepared to discuss subjects intelligently and with fitly chosen words. More energetic work was required in order to reach a higher state of perfection.

Dr. CROUSE (in closing) took exception to the remarks of Dr. Johnson, that he could not at the end of two or three months determine whether a young man would make a good dentist or not. He thought he could. He believes it takes a greater variety of ability to be a good dentist than it does any other profession or business. A man to be successful as a dentist must be both capable and honest. He thought a number of the young men entering the profession to-day lost sight of honesty, and that their motives were purely mercenary.

INTER-STATE DENTAL ASSOCIATION TO BE HELD AT EXCELSIOR
SPRINGS, MISSOURI, JUNE 23-26, 1896.

OFFICERS—Dr. E. L. Brooks, President Iowa Association; Dr. J. S. McCleery, President Nebraska Association; Dr. J. P. Root, President Kansas Association; Dr. A. C. Griggs, President Missouri Association.

EXECUTIVE COMMITTEE—Dr. J. P. Root, Chairman; Dr. S. C. A. Rubey, Secretary.

FOR IOWA—Dr. F. M. Shriver, Glenwood; Dr. F. P. Weber, Cherokee; Dr. A. O. Hunt, Iowa City.

FOR NEBRASKA—Dr. H. W. Shriver, Omaha; Dr. W. A. Ivory, Wayne; Dr. O. M. Heustis, Nebraska City.

FOR KANSAS—Dr. L. C. Wasson, Topeka; Dr. C. E. Esterly, Lawrence; Dr. J. P. Root, Kansas City.

FOR MISSOURI—Dr. J. T. Fry, Moberly; Dr. W. L. Reed, Mexico; Dr. S. C. A. Rubey, Clinton.

CLINICAL SUPERVISORS—Dr. H. J. McKillops, Sup. Gen'l; Dr. L. K. Fullerton, Iowa; Dr. O. M. Heustis, Nebraska; Dr. C. B. Reed, Kansas; Dr. H. S. Lowry, Missouri.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

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ASSOCIATE EDITORS:

THOS. E. WEEKS, D. D. S.

A. E. MOREY, PH. B., D. D. S.

CORRECTING MALPOSED TEETH.

What enormous strides have been made in so short a period as dates from the publication of *Kingsley's Oral Deformities*. At that time many of the worst cases of irregularities of the teeth received no attention, or what little they received was included in the extraction of a tooth or two. Now it is hardly possible to take a walk of a mile or two without seeing through the parted lips of a child of twelve years or upward, evidences that the workers in orthodontia are correcting some deviation of the dental arch. This will in time lead to a race of better looking people and at the same time will add to their longevity. Increased efficiency of the masticatory apparatus means better nourished people, because the food is better prepared for the stomach. It is a matter of congratulation that so many men of ingenuity and talent are devoting themselves to work of this kind, and are doing it so effectively that they may be considered true benefactors. No one field in dental practice opens up such possibilities, at present, as orthodontia.

THEN AND NOW.

Any one curious enough to look over a dental catalogue of twenty or thirty years ago will see that the cuts of the instruments termed scalers are enormously too large for present use; indeed, none of the present modern delicate instruments were to be found thirty years ago, save now and then in the office of some particu-

larly skilled operator. The calcareous deposits on teeth much below the gum line were not removed very successfully, if at all. (Even now instances are not rare where the deposits are not well removed.) With the patience of thoughtful men here and there, the inventive faculty has brought out numerous forms of scalers, punches and gouges for the detachment of the different varieties of calculus. There is little excuse for the lack of faithfulness in the removal of the last vestiges of such deposits from the roots of teeth. The operation commonly called scaling of the teeth is too hurriedly gone over, not enough time being spent on individual teeth. It is more satisfactory to thoroughly scrape and push the concretions from one tooth and wash them out of the pouches or pockets, than to go over a half dozen and leave small bits of deposits in the space between the gums and the roots to cause irritation and suffering to the patient. We ask for more attention to this subject, more skill, more patient attention to details, more delicate instruments to be used, more humanity.

REVIEWS AND ABSTRACTS.

THE DISEASES OF CHILDRENS' TEETH, THEIR PREVENTION AND TREATMENT. A MANUAL FOR MEDICAL PRACTITIONERS AND STUDENTS. By R. DENISON PEDLY, M. R. C. S., L. D. S., Eng., etc. With numerous illustrations. Pp. 268. Published by J. P. Segg & Co., London, Eng., and the S. S. White Dental Mfg. Co., Philadelphia, Pa.

We have read this very nicely printed book with pleasure, as it is well composed and of good type. The illustrations are mostly self-explanatory, and cover the subject in a way which must be beneficial to most medical men and medical students. The works of Barrett (A. W.), and Parreidt in this line, both excellent treatises, are not quite up to the one under consideration. The subjects treated are "Structure," "Eruption," "Caries," "Inflammation of the Pulp—pulpitis," "Inflammations of the Peridental Membrane," "Irregularities of the Teeth," "Hygiene of the Mouth," and "Treatment." The latter term includes the care of aching teeth, the filling of teeth, and extraction, as well as the "scaling" of teeth. Most of the recommendations for the use of antiseptics are good. Altogether the work must prove of service to teachers and students in medical schools and colleges.

THE TRANSACTIONS OF THE ILLINOIS STATE DENTAL SOCIETY.

Thirty-first annual meeting held in Galesburg, May 14-17, 1895.

Louis Ottoly, Secretary.

This is a volume of 279 pages. It is to be regretted that societies, like individuals, at times seem to be dormant for a period and then at one bound they are very wide awake. The transactions before us are of the dormant kind. 1895 was not an epoch making year for Illinois. All of the work done during 1894-95 seems to have been done during the great calm following the work of the dental congress. Probably the best papers in the volume are Dr. Ames, Dr. Cattell and the paper of Dr. Case. These three papers, the first, "Combinations of Metals;" second, "On Experimental Root Filling," and the third, "On Abnormal Lateral Bite," are well worth reading again. The discussions are far ahead of the other papers read. We often find in a discussion just the thing that the author fails to include in his paper. The two historical papers on the "History" and "Statistics" are in the line of landmarks, but are of no scientific value. That is what is most needed—even in State societies. The great State of Illinois is not in need of such pabulum as is comprised in most of the remaining papers read, they might be useful in training schools for dentists just about to graduate, or small local gatherings, but as a first-class output for educational value they lie close to zero. Illinois with its 1,500 or more dentists will have to get her best men to do a little work at home and not send it all over this broad country of ours, if it wishes to keep close to the leaders of thought in other great States and countries. One or two scientific papers, three or four practical ones, on everyday topics and some good clinics will attract more than one-fifteenth of the dentists of the State to an annual meeting. In the past thirty years the work of the society, with two or three exceptions, has been of such a character as to attract the interest of the leading minds of the world. This last volume is not of such character as a whole. When the committee on program for 1896 goes to work it ought to have in mind the absolute necessity of getting the best papers attainable; a few good papers are more to be sought than many of no pith. G. S.

PRACTICAL NOTES.

A CASE OF IMPLANTATION UNDER HYPNOTIC INFLUENCE.

BY A. M. MARKLE, D. D. S., CHICAGO, ILL.

It has been my privilege to witness and assist in a case of implantation of three lower incisors for a patient of mine by Dr. J. W. Younger, of San Francisco. Dr. Younger had treated a bad case of pyorrhœa for the upper incisors, and noted that the patient was using a plate for the lower, and suggested implanting, to which the patient readily consented. We secured three teeth that had been out but two days, and after preparing the teeth was about to begin implanting when Dr. W. X. Sudduth came in.

Dr. Younger suggested that Sudduth hypnotize the patient for the operation, and thus have a double clinic. Dr. Sudduth did so, and it was certainly as fine an exhibition of hypnotism and implantation as one could ever see. Dr. Sudduth had the patient under hypnotic influence for over four hours, yet the patient was perfectly conscious of what was being done, but suffered no pain, and when we had finished the operation said he thought it had been about fifteen or twenty minutes. The patient would clear the mouth of blood at any time, at the suggestion of Dr. Sudduth, lie back in the chair and the operation would go on. The patient was over fifty years old, the teeth had been out for three years, so that absorption was complete, and the bone very hard, making the operation more difficult, and requiring more time, but through the entire operation he did not suffer at all. When the operation was complete Dr. Sudduth aroused the patient, and in five minutes he was ready to go, feeling as fresh as one should feel in the morning. Dr. Younger is certainly an expert in more ways than one. The way he handles cases of pyorrhœa is to me a revelation, and if there is a cure for this very prevalent disease, I think Dr. Younger has it. His ligating of teeth with silk ligatures, is something to be admired, and his skill in these lines cannot be acquired in a short time.

Dr. Younger said if the patient for whom we implanted the teeth had been a younger man he would not have removed the nerves, but would have implanted feeling reasonably sure that they would reestablish themselves; said that he has several times put fillings in teeth that have been implanted for several years.

MEMORANDA.

Dr. E. G. Betty, of Cincinnati, spent the holidays in Chicago.

A few of the drugs that have come to stay are * * * * * and trional.

Dr. W. V-B. Ames was married to the daughter of Dr. Thomas L. Gilmer, in December.

It seems that few of the makeshifts for retaining fillings in teeth last longer than a year or two.

Dr. W. J. Younger has had a successful visit to New York, and will return to Chicago January 15.

Mrs. W. H. Morgan, of Nashville, wife of the venerable dean of the dental department of Vanderbilt University, is dead.

It will be observed that Dr. Cleveland has plugged the free silver yawp with a gold filling. But sooner or later the yawp will have to be pulled.—*Chicago Tribune*.

Through the kindness of Dr. A. J. Oakey we have seen a root filling of gutta-percha in a root of a temporary molar which, four years after its insertion was found to be perfect, the root walls having been absorbed or torn down from it.

Dr. H. H. Johnson has retired from the editorial tripod, to devote himself to more lucrative labor. Under the management of Dr. Johnson the *Southern Dental Journal and Luminary* has been one of our valued exchanges, and we are sorry to lose him from our midst.

A NEW DENTAL JOURNAL.

La Union Dental, of Valencia, Venezuela, began its first year of life in November, edited by Drs. L. M. Cotton, R. P. Lince and A. A. Nouel. It is published in the Spanish language.

One of the new industries is the dental press clipping bureau. To one not aware of this work it is astonishing what a large place the dentist holds in the public press. Much of the matter is worthless from the standpoint of interest, but straws show which way the wind blows.

The new appendix to *Dunglison's Medical Dictionary*, containing about twenty-four pages, has all the newly coined words to be found in recent writings of the best scientific authors of both continents. If you have a *Dunglison* write to the publishers, Lea Brothers & Co., Philadelphia, for a copy.

A DENTAL COLLEGE INCORPORATED.

Articles of incorporation for the Inter-State Dental College of Kansas City were filed to-day. The capital stock is \$2,000. The incorporators are S. Cole, man and Charles N. Dartt, of Kansas City, and John M. Marcy, of Council Bluffs, Iowa.

There will be held a Medical Congress in Sydney, New South Wales, the coming February. It is hoped that a dental section may be organized for future

congresses. They are trying to get a dental bill in that enterprising country through the efforts of our friend Dr. Alfred Burne, and others, so N. S. Wales will not be a dumping ground for the rubbish of the earth.

OHIO STATE DENTAL SOCIETY.

The annual election of officers resulted as follows : President, Henry Barnes, Cleveland ; First Vice President, L. E. Custer, Dayton ; Second Vice President, Grant Molyneaux, Cincinnati ; Secretary, L. P. Bethel, Kent ; Assistant Secretary, L. L. Barber, Toledo ; Treasurer, C. J. Keely, Hamilton.

The association adjourned to meet the first Tuesday in December, 1896, in Columbus.

Out in the region of the setting sun, that is in New South Wales, hypnotism is being discussed in the secular press with much enthusiasm. Through the courtesy of Dr. Alfred Burne, a member of the Dental Congress of Chicago, 1893, we are in receipt of late papers from Sydney containing several articles on the subject. In this connection be it noted the DENTAL REVIEW is quoted (Dr. Fillebrown's paper). A few years hence, when we get thirty-knot steamers, we are going out to be hypnotized so we will be able to talk better on the subject. In the meantime, read a short note by Dr. Markle in this issue.

The Isaac Knapp Dental Coterie, of Fort Wayne, Ind., is doing some good work for the profession and the public. It has already published a brochure on the care of the teeth and is engaged in the laudable undertaking to give instructions to pupils in the public schools of our native State. Once a month a meeting is held in the office or residence of a member and a topic of professional or public interest is taken up and discussed. Other cities of the size of Fort Wayne might well follow the example of this coterie, and if they are fortunate enough to have such an energetic president as Dr. Seneca B. Brown to lead, the coterie will be a success from the beginning. A little more enthusiasm and less lethargy will do more to cement and broaden the profession than so many theoretical, padded bygones, as we are oft compelled to wade through.

HYPNOTISM.

The Chicago Tribune of December 28, had a dispatch from Baltimore, giving an account of the use of hypnotism in a surgical operation which lasted an hour, as though it was something wonderful. In this city, several weeks ago. Dr. W. J. Younger, of San Francisco, the specialist in the implantation of teeth, in fact the originator of the method ten years ago, implanted three teeth in the lower jaw of a well-known contractor, who had been hypnotized by Dr. Sudduth. He was in this condition nearly four hours, and felt no pain, and declared he thought it was only twenty minutes.

The process of implantation consists of drilling a hole in the jaw and implanting a natural tooth, which becomes in time firm as the others.

L. P. HASKELL.

Lately we removed a third molar tooth from the mouth as follows : On examination it was found lying lengthwise of the jaw, the crown being in contact with the distal surface of the second molar, a little below the gum line. After dissecting the gum away from the surface, a large cavity was found on the *distal* surface

of the crown. Arsenic was applied and the pulp destroyed. About one month afterward the tooth was nearly severed with fissure drills, and a wedge shaped steel instrument was inserted to complete the fracture of the tooth. This was done with two or three sharp blows from a heavy mallet. The crown portion was then removed by turning it inward with a pair of long beaked root forceps. Later a pair of long slender bayonet forceps were used to grasp the root portion. After some difficulty the roots were withdrawn. The time required for this operation was about one hour. Cocaine was used as an anæsthetic, 2 per cent solution. The tooth had caused a facial neuralgia for more than eight months prior to its removal. Two weeks after it was taken out the pains ceased.

CAUGHT NAPPING.

The *International Dental Journal* says: "No papers will be received for this department (original communications) that have appeared in any other journal published in this country." On page 17 of the January issue is to be found a paper which first appeared in the *Dental Digest* for May, 1895, page 264. This paper is almost word for word a duplicate of that published by the *Digest*. We were caught once in the same way early in our career in journalism. If we know it beforehand we do not republish matter as original. The query is: Do authors send duplicates to several journals, or do the journals use such matter to "fill" in with, our own opinion is that the authors are to blame as a rule. In the gutter variety of journals of course, credit is never given for a previously published paper; indeed we have seen a fairly good paper cut into three or four parts, each part being published as an "original" paper in a single issue, with the name of the author but not the source from whence it was taken. That is not professional journalism. What is it?

Otto Arnold, D. D. S., of Columbus, Ohio, in a paper entitled "Alveolar Dental Hæmorrhages," read before the Tri-State Dental meeting, says:

My universal method of procedure in the management of hæmorrhage following tooth extraction, is to have the patient rinse the mouth freely with hot water. This encourages free and uninterrupted bleeding from the wound, and stimulates a normal reaction in the tissues, soon followed by a natural cessation of the hæmorrhage.

If any considerable amount of laceration has taken place, I attempt to replace the tissues by compressing with the fingers or stitching into apposition any pendent portion of the gum, prescribing as a dressing:

R Tannic acid.....gr. xx.
 Listerine.....
 Aqua dist..... aa ζ iv

M. Sig. Apply frequently to the wound.

QUINCY DENTAL CLUB—FORMATION OF AN ORGANIZATION OF QUINCY'S LEADING DENTISTS.

Fifteen dentists met at the Y. M. B. A. rooms last evening and organized a mutual benefit club. Constitution and by-laws were adopted, and the following officers were elected:

President, Dr. R. A. Gardner; Vice President, Dr. George Thompson; Secretary, Dr. Henry L. Whipple; Treasurer, Dr. Harry Wellman. The

Executive Committee is composed of Drs. Gardner, Baker, Brown, Irwin and Hug.

At the club meetings, which are to be held on the third Monday of each month, essays will be read, followed by discussion. There will from time to time be changes in the programme to give it variety and spice and still maintain its features of instruction and mutual improvement.

Dentists in the towns around Quincy are cordially invited to join and contribute in a literary way to the good of all.

A PRACTICAL POINT IN THE USE OF DISINFECTANTS AND ANTISEPTICS.

A. G. Young, M. D., Secretary of the Maine Board of Health, says: In the large mass of literature which has appeared on the subject since Koch's paper, "On Disinfection," it is rather surprising that the practical value of one of the suggestions in that paper was not more promptly apprehended and worked out. It was contained in this paragraph:

"Yet it is probable that many disinfecting agents which, under ordinary circumstances are inefficient, may become sufficiently active when combined with moderately increased temperatures; possibly also some such substances which have no disinfecting action at all at temperatures in the neighborhood of 20° C. as the example of carbon bisulphide teaches, may be used with excellent results at somewhat higher temperatures. In this direction, then, is a field open which will well reward experimental activity, and which all the more deserves attention because exact experiments are wanting with all but a very few of the greater number of disinfectants and these have been shown to be practically useful only under certain conditions."—(*Mittheilungen aus dem Kais. Gesundheitsamte*, 1, 249, 1881.)

In 1889, Prof. Scalji (*Bulletin Medical Revue d'Hygiene*, xii., 82, 1890), of Rome, mentioned the following significant facts:

Normal urine, when maintained at a temperature of 45° C., undergoes fermentation as readily as when left at a temperature of from 15° to 25°. If 5 centigrams of corrosive sublimate are added to one liter of urine, making a solution of 1 to 20,000, the urine putrefies at the end of several days if left at ordinary temperatures; but it is preserved a month or more without a trace of fermentation if its temperature is maintained at 40°. At this temperature of 40° the antiseptic action is assured with a dose of only 1 to 100,000 of the sublimate.

Furthermore, Prof. Scalji states that when urine which contains 1 to 100,000 of sublimate is kept at the temperature of 40° several days, and then allowed to remain at ordinary temperatures (15° to 20° C.), no trace of fermentation appears.

Behring (*Zeitschrift für Hygiene*, ix., 395, 1890), refers to the fact, which has been confirmed by various observers, that a 5 per cent solution of carbolic acid at ordinary room temperature will not, even after many days, destroy anthrax spores with certainty, but he shows that when the temperature of the solution is raised to 37.5° C. their destruction is complete in three hours.

Caustic solutions of the alkalies are more or less rapidly germicidal according to their strength, but Behring learned that the alkaline carbonates may become very energetic disinfectants when used at higher than ordinary temperatures. After working with strong solutions of carbonate of soda and of alkaline soaps,

and finding that they at degrees of temperature above 70° and 80° were rapidly effective, made a solution of washing soda about as it is used in laundries, and containing about 1.4 per cent of soda. This solution at 80° to 83° C. destroyed anthrax spores in ten minutes, and at 75° C. in twenty minutes.

He confesses that these results with warm and hot solutions of washing soda surprised him, particularly as he had, through special control experiments, assured himself of the high powers of resistance which his anthrax spores possessed.

But so far as I know, Heider (*Archiv. für Hygiene*, xv., 431, 1892), has marked out more fully than any one else the influence which moderately increased temperature has upon the action of disinfecting solutions. Among the results of his investigations we may note the following in which anthrax spores served as the test, and the number of minutes, hours, or days given being the time required to sterilize them.

Carbolic acid 5 per cent solution, at ordinary room temperature, not destroyed in from thirty to forty days; at 40° C., four hours; at 55° C., from three-fourths to two hours; at 75° C., from three to fifteen minutes.

Pure carbolic acid and sulphuric acid equal parts of each by weight, 5 per cent solution at 40° , in two hours; at 55° , in thirty minutes; at 75° in one minute.

Pure cresol and sulphuric acid, equal parts of each, 5 per cent solution, at 40° , in one hour; at 55° , in five minutes.

Lysol, 5 per cent at 60° C. sterilization not effected in two hours; at 80° , sterilization complete in five minutes.

Sulphuric acid, 1 per cent at ordinary temperatures, sterilization not effected in seven hours; at 75° C., sterilization in seventy minutes.

Caustic potash, 5 per cent solution, at the temperature of the room, failed to sterilize in eight to ten hours; at 55° , spores destroyed in three-fourths to two hours; at 75° , in two to ten minutes.

Hot water, at 70° , in eight to nine hours; at 85° , in forty to forty-five minutes; at 95° , in fifteen minutes.

Sporeless bacteria, of course, succumb much more readily to the germicidal powers of disinfectant. With *staphylococcus pyogenes aureus* as a test, sterilization was complete at the temperature of 60° ; with carbolic acid, 1 per cent, in five minutes; with carbolic acid and sulphuric acid, 1 per cent, in one minute; with caustic potash, 1 per cent, three minutes; with lysol, one-half per cent, three minutes.

Several explanations of the reason why warm solutions of disinfectants show a more energetic germicidal action than cold solutions suggest themselves. One is the well-known fact that the intensity of chemical action increases with increasing temperature; another is that moderately elevated temperatures favor the functional activity of bacterial life and therefore the rapidity with which poisons are absorbed. But when we have to do with sporeless bacteria, and that is the case in nearly all of the real work of disinfection, we have the direct coöperation of moist heat in destroying its vitality, even when the increase in temperature is hardly more than moderate.

Practical applications of the results of these investigations readily occur. In the first place, they suggest a grave doubt as to the efficacy of some processes of

disinfection and antisepsis as they may be carried out during the cold season. Next, they teach the great advantage of using antiseptic and disinfecting solutions warm or even hot.

In the disinfection of material containing the bacillus of tuberculosis, we have to do with an infection hard to destroy, but about whose powers of resistance, whether against chemical disinfectants or heat, investigators differ. Schill and Fischer (*Mittheilungen aus dem Kais. Gesundheitsamte*, ii., 142, 1884) state that twenty-four hours are required for a 5 per cent solution of carbolic acid to disinfect tuberculous sputum. But the disinfection may be more rapidly and certainly accomplished if the carbolic solution for the disinfection of clothing be heated, or if the spittoon containing tuberculous sputum and disinfecting solution be filled with hot water and set aside to cool before it is emptied. Warm or hot solutions may therefore be used for the purpose of increasing the intensity of action of some of the disinfectants, thus extending the range of their applicability.

When the articles to be disinfected can be subjected to the action of the solution for only a short time, as in washing floors or other woodwork, wiping down walls, or rubbing articles of leather or upholstered furniture which cannot be disinfected otherwise, rapidity and certainty of action should be increased by increasing the temperature of the disinfecting solution.

In clinical disinfection and antisepsis, it is an advantage to use the solutions as warm as practicable. It will sometimes enable us to diminish the strength of our solutions and thus minimize the danger of toxicity without loss of disinfecting effect. In the dressing of wounds, and as intrapleural and intrauterine injections Prof. Scalji says that he has used with excellent results very dilute but very warm bichloride solutions (40° to 45° C).

Another point of advantage in the use of warm disinfecting solutions is made by Nocht (*Zeitschrift für Hygiene* vii., 521, 1889). In the use of the so-called 100 per cent carbolic acid its slight solubility in water is a hindrance. Mixed with water in the proportion of 5 to 100, a large portion of it remains undissolved. Clothing immersed in the mixture is permanently spotted and injured, for the reason that the fabric readily absorbs the insoluble part as well as the watery solution, and so is in places, subjected to the action of the undiluted agent. If, however, to a hot solution of soap and water the carbolic acid is added, and the mixture stirred, a clear solution is formed; 3 per cent of soap in water at 60° will render 6 per cent of carbolic acid soluble. The appearance of fabrics soaked in this solution is much better than if subjected to the simple watery solution. The germicidal action of the solution is not increased by the presence of the soap, but heightened temperature makes it distinctly more effective. At 50° a 5 per cent solution with soap destroyed anthrax spores in six hours.—*Druggists' Circular*.

The Odontological Society of Chicago will hold monthly clinics, beginning with March, 1896, continuing for four months. These clinics will be given in the offices of the members.

STATEMENT AS TO PROPOSED TAX FOR THE IOWA UNIVERSITY.

The tax of four-tenths of a mill which will be asked for the University would yield annually about \$220,500 which would give, with the present permanent annual appropriation of \$53,000, the interest upon the University Fund of \$16,000, and tuitions of \$50,000, a total annual income for all purposes of \$339,500. Of this it is proposed to use \$150,000 per year for buildings and thus provide out of the proceeds of this tax for five years a Collegiate Building, a Library, a Museum, a Medical Hospital and other buildings which have been greatly needed, and without which the efficiency of the University has been impaired and its growth restricted. Even when this expenditure shall have been made the total expense of buildings for the University will not exceed that which has already been incurred by Michigan, and will not nearly equal the sum spent at the University of Chicago for that purpose within a few years.

The income for support left, after deducting from the total annual income the amount to be set aside for buildings as above proposed, would be about \$190,000, or \$60,000 more than the average income for that purpose during the past two years, and would still be a less annual income for support than is enjoyed by the State University of Michigan, Wisconsin, Minnesota, Illinois, or California.

The plan of an annual tax is one which has been adopted in Michigan, Wisconsin, Minnesota, Nebraska and other States, but it is to be noted that in these States appropriations have been made periodically in addition to the tax for buildings and support, while the tax here proposed would relieve the State from further biennial appropriations, and enable the Board of Regents to plan in advance for the expenditure of the income in the most economical and beneficial manner.

CLINICS.

Third Annual Clinic given by the Alumni Association of the Chicago College of Dental Surgery, to be held Monday, January 20, 1896, 10 A. M. sharp, at the College Building, corner Wood and Harrison Streets. Dr. A. D. O'Neill, Jr., President; Dr. Winthrop Girling, Secretary. W. J. Younger, San Francisco, Pyorrhea; L. P. Haskell, Chicago, Continuous gum work; A. H. Peck, Chicago, Porcelain face bicuspid crown. All soldering done in Bunson burner, absolutely no investment; H. A. Costner, Chicago, Filling root canals with metal; J. E. Hinkins, Chicago, Filling with platinum and gold foil; C. S. Case, Chicago, Orthodontia; L. E. Custer, Dayton, Electric furnace; W. H. Taggart, Chicago, to be selected; F. F. Fletcher, St. Louis, to be selected; G. D. Sitherwood, Bloomington, Aluminum plates; W. C. Barrett, Buffalo, Anæsthesia; J. W. Wassall, Chicago, Compressed air apparatus used at the chair; W. A. Stevens, Chicago, Gold filling, using crystal mat or felt gold; C. N. Thompson, Chicago, Porcelain inlay; W. V-B. Ames, Chicago, Oxyphosphates; W. E. Griswold, Denver, Preparing teeth for crowns; A. J. Harris, Chicago, Demonstrating the Harris mallet; L. W. Nevius, Chicago, Nitrous oxide; H. B. Wiborg, Milwaukee, Electricity in the practice of dentistry; T. W. Brophy, Chicago, to be selected; T. E. Weeks, Minneapolis, Minn., to be selected; A. C. Hewitt, Chicago, Ill., to be selected.

OBITUARY.

DR. JOHN DE HAVEN WHITE.

One by one the aged are taken from us, and like the songs of the olden times are only brought back to memory by an obituary. One of the old veterans went to his long rest in Philadelphia Christmas day. The following is taken from the *Public Ledger* of December 26:

John De Haven White, M. D., D. D. S., A. M., died yesterday, after a brief illness of organic heart trouble, at the Masonic Home, Broad and Ontario Streets. He had for some time past complained of pain in the region of his heart, and on Friday of last week was placed in the infirmary, where, despite the efforts of his physician, he gradually grew worse, until a few minutes after six o'clock yesterday morning, when he expired.

Dr. White was born in Lancaster County eighty years ago, and when quite young came to this city, where after completing his schooling, he studied medicine in the Jefferson College, from which he was graduated in 1843. He subsequently devoted himself to dentistry, and opened an office on Tenth Street, near Samson, and afterward followed his profession for twenty years at 1115 Walnut Street. Then he removed to No. 8 West Penn Square, subsequently to 1631 Arch Street, to Vine Street above Seventeenth, and finally 1428 Pine Street.

He became connected with the Pennsylvania College of Dental Surgery when it was located on Arch Street, below Sixth, and remained with it a number of years after its removal to Tenth and Arch Streets, filling the position of Professor of Anatomy and of Operative Dentistry. He was admitted to the Masonic Home on December 23, 1891, as a member of Montgomery Lodge No. 19, F. and A. M.

In early life Dr. White was married to Mary E. Meredith, a daughter of Joseph Meredith, who was a cousin of William M. Meredith. Mrs. White died in July last. Of their eleven children but three survive: Mrs. W. J. Van Lott, of Clifton Heights; Dr. John De Haven White, of South Media, and Dr. Horace Meredith White, of 1616 Chestnut Street.

A short time prior to entering the Home Dr. White published a volume of poems. At one time he edited the *Dental News Letter*, the name of which was subsequently changed to the *Dental Cosmos*. He was a member of a large number of dental societies, and at one time was invited by Emperor Napoleon III. to practice his profession in Paris. Among those who were formerly his pupils are Dr. Thomas W. Evans, the well-known American dentist of Paris, and Dr. John D. Thomas, of 912 Walnut Street.—*Philadelphia Public Ledger*.

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No. 2

ORIGINAL COMMUNICATIONS.

THE PREPARATION OF COMPOUND PROXIMAL CAVITIES IN BICUSPIDS
AND MOLARS*

BY A. H. PECK, M. D., D. D. S., CHICAGO, ILL.

No claim to originality is made in the consideration of this subject.

Many of the ablest men in the profession have written and said much regarding it. Among which subject matter by no means the least is a series of articles published in the *Dental Cosmos* of '91, from the pen of Doctor G. V. Black. In the face of all this, it would seem exceeding unreasonable on the part of any one to expect anything new from me. Indeed, about the only comfort I am able to glean from this condition of things, is the very pleasing thought that Dr. Black ought to consider that he has abundant reason for hearty self-congratulation that his ideas regarding the preparation of this class of cavities so very nearly coincide with mine.

I wish also to express my indebtedness to Dr. Johnson for the kindness he has shown in loaning his plaster casts, that I may be the better able to illustrate my ideas. And when I look at the manner of the preparation of these cavities, in their entirety, I find myself again stumbling about in wonderment as to however he has been able to so nearly anticipate, and to so marvelously ex-

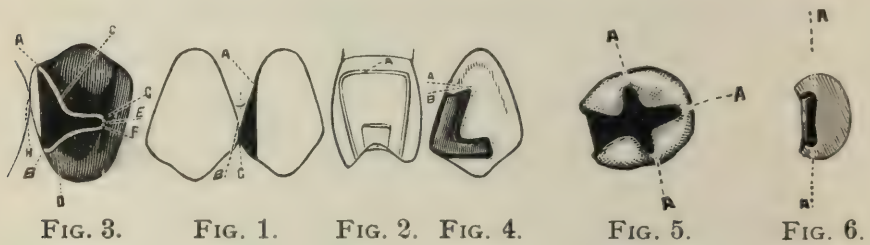
*Read before the Odontographic Society, of Chicago.

cute my ideas in this regard, and *anticipation* it must have been, because I have never before written on the subject.

However this may be, the number of cases (the proximal surfaces of which, having been wasted away by the carious process, to a very considerable extent) in which the cavity should not be extended to the occlusal surface, is indeed comparatively very small.

In none but the very largest and densest and strongest of teeth, and even then only when a considerable thickness of healthy dentine remains to support the proximo-occlusal angle of enamel, should the operator stop short of the occlusal surface. And even under these conditions, it will be advisable to extend the cavity to the occlusal surface in more cases than it will be to not do it.

But our subject to-night is a forerunner of the fact that we



are to confine our dealings with cavities that must be extended to the occlusal surface, hence we cheerfully dismiss any further consideration of the arguments in favor of such an extension, and shall feel perfectly satisfied if what little has been said results in eliciting interesting and instructive discussion.

The cervical margin of these cavities should almost invariably be extended rootwise sufficiently that in the completed operation the gum festoon will completely cover the line of the margin of the cavity and the filling. (a fig. 1). Because it is true that caries will not occur or recur on any surface that is protected by a covering of healthy gum tissue.

This principle has been laid down by a much wiser head than mine, and I have observed it to be correct, and so have you, if you have had any observation at all on this phase of the subject. Hence the statement that even though the operation at this point

NOTE.—Figures 1, 2, 3 and 4 are from Dr. Black's cuts in the *Dental Cosmos*.

may be faulty, the adaptation of the filling material to the wall of the cavity—the margin—be imperfect, little concern need be had for the future safety of the operation, provided this part is completely covered by healthy gum tissue.

This must, by no means, be construed by *any* as an encouragement to the performance of faulty operations, even at this point of apparent safety.

The base of the cavity should be broad and nearly flat (a, fig. 2), except for the slight variations necessary to impart the proper bevel to the enamel margin, which will be more fully considered farther on.

Both the buccal and the lingual walls should invariably be cut away to such an extent that in the completed operation the marginal line of the enamel and the filling will be safely removed from the contact point of the approximating tooth (a and b, fig. 3). This is a most desirable condition of things, if only for the one fact that it renders it perfectly easy for the patient to keep the operation clean with the brush along the line of the filling and the tooth, thus reducing to a minimum, other things being equal, the liability of caries recurring at this part of the operation.

The buccal and lingual walls should rarely ever be permitted to converge as they approach the occlusal surface, but rather to diverge, if any variation at all from that of the parallel is to be had.

Approaching the occlusal surface, the number of teeth in which it is not advisable to extend the cavity nearly across to the distal or the mesial angle as the case may be, is less than that in which it is advisable to so extend the cavity. (And I am speaking now especially of the bicuspid.) The buccal and lingual angles at the occlusal surface should be so extended that the force from occlusion falls upon the filling, thus protecting the enamel margins at these points, and doing away with the liability of future breakage under the force of mastication. (c and d Fig 3.)

The exact extent to which the margins should be cut at these points must depend on the conditions present in each individual case, such as the amount of destruction by the carious process, general strength and quality of the tooth.

Only in the largest teeth of the very best quality and in which the fusion of the two plates of enamel along the sulcus between the cusps is absolutely perfect should the cavity fall short of being extended across the occlusal surface; and in many cases

like this even in which it is necessary to contour the filling to a considerable extent, the cavity must be extended if proper anchorage is had. (e Fig. 3.)

To just what extent it will be necessary to widen the cavity at the proximo-occlusal angle when being extended for the express purpose of imparting proper anchorage to the filling, must be determined very largely by the operator's own good judgment, and the conditions present in each individual case.

Dr. Black, in considering this particular point, has drawn conclusions based upon scientific reckonings, and any who have not done so will indeed do well to consider them. In every case in which the enamel plates are not perfectly fused, or the sulcus is at all faulty or is unusually deep, the cavity should be extended. And especially so in the teeth of the young, in fact, under these conditions I can conceive of no manner of circumstances that will justify the operator in not doing so.

So far the directions in general which have been given for the preparation of these cavities in the bicuspid, will apply as well to preparation of similar cavities in the molars. Indeed, about the only difference between the two is, that in the molars it is often necessary to extend the cavity in several directions on the occlusal surface, because of the presence of fissures which extend in a lateral direction toward the buccal and lingual surfaces (a a, Fig. 5). At no portion of the cavity, either the margin or the interior, should any positively square angles be permitted to remain.

They should always be rounded (f and g, Fig. .3) Because it is much easier to pack filling material (and of course we now have gold in mind) perfectly, or as nearly so as is possible, into a rounded angle, than it is into one whose walls describe an acute, a right, or even an obtuse angle.

The base or "seating capacity" of these cavities should always be as broad bucco-lingually, and deep as the circumstances will permit. And by the expression "deep" we mean distance from the surface of the tooth toward the pulp, at right angles with the long axis of the tooth (dotted line a, Fig. 4.)

This is perhaps, the class of operations upon which greater strain is brought to bear, by reason of mastication than any other made in practice. Hence the necessity that great care and attention be given to the proper shaping of the base upon which the filling is to rest. This portion of the cavity should not be rounded

or saucer shaped, but should be flat. And also, this plane representing the base, should tend slightly root-wise as it approaches the deepest portion of the cavity (dotted line b, Fig. 4.)

The inner surfaces of the buccal and lingual walls should never be marred by the cutting of narrow, well-defined grooves, or undercuts, so-called, for the purpose of retention. This is positively unnecessary.

And right here permit me to digress sufficiently long to clear up what seems to be a somewhat common delusion in the minds of many practitioners regarding the use of pits and grooves as the means for retention of fillings.

In the first place, the number of cavities we come in contact with, in which it is necessary to resort to this method for anchorage, as compared with those in which this method is not necessary, certainly constitutes the insignificant minority. However, to those who think they must use the pits and the grooves, let me say courteously but positively, that undue depth of either, or both, is by no means conducive to greater strength.

I know many think and even advocate the abnormal deepening of the undercuts for the purpose of imparting greater stability to the filling. Indeed, I have oftentimes seen teeth whose crowns have well nigh been ruined through this wanton waste of substance.

Nothing can possibly be more remote from common sense and true logic. From this time on, let it be studiously borne in mind that that portion of the filling material which performs the office of retention, is only represented by the bulk, however great or small, at the very entrance of the undercut. And if one would seek to impart greater strength and stability to the operation through the medium of the undercuts, let him, instead of extending them to twice the depth, cut them to twice the width, thus increasing by twofold the bulk of filling material at the very point where the strain is exerted.

No, let the inner surface of the buccal and lingual walls of these cavities remain smooth, as is the surface of the base of the cavity. These surfaces should gradually diverge the one from the other, as the deepest portion of the cavity is approached, all the way from the base as far as the dentine extends toward the occlusal surface, thus imparting a dove-tail form to the cavity from the base downward (a a, Fig. 6).

The walls of that portion of the cavity in the occlusal surface

should be so formed as to bear the same general relations to each other as do those of the proximal portion of the cavity. The ending of this portion of the cavity should present a well-rounded outline.

The very greatest care is necessary in the preparation of the enamel margins. They must in all cases and at all points be so extended that none but sound, healthy tissue is to be found in them; and also the enamel must at all parts be supported underneath by sound healthy dentine. They must, at all points, be so beveled that no short prisms remain at the marginal lines of the enamel, but rather at the inner portion, resting upon the dentine.

The meaning of these two phrases "the line of the enamel margin," and "the marginal line of the enamel," must not be confounded; the first expression being used to indicate the entire surface—thickness of the enamel at the margin of the cavity; the other simply meaning the line of the outer edge of the enamel.

In order that one may be able to impart the proper bevel to the enamel margins at all parts of the cavity, it will at once be obvious that an accurate knowledge of the anatomy of this tissue—the direction assumed by the prisms at the various surfaces of the tooth, is absolutely essential.

The enamel margin should be so shaped that its surface is left perfectly flat.

No rounded effect under any circumstances should be imparted to the enamel along its marginal line. This should be left a positively sharp, well-defined angle, thus permitting the filling material, at the margins, to be carried to the very surface of the operation, a thick, strong body.

They should be made just as smooth as manipulative skill is capable of doing.

With regard to the finished operation, I will simply say that the filling should be so contoured, not necessarily with a view to the restoration of the original outlines of the tooth, because in some cases nature can be improved upon in this respect, but rather with a view to the restoration of the interproximate space to its normality (b, fig. 1), thus favoring the restoration of the gum festoon, which has, no doubt, by this time, suffered more or less by a destruction of its tissue, and the restoration of which is quite necessary to the future comfort of the patient.

And also with regard to the contact point with the approx-

imating tooth, which is in itself an exceedingly important consideration. (c, fig. 1) also (h, fig. 3).

I have, knowingly and purposely, refrained from any consideration of the most desirable and feasible forms of instrumentation for the preparation of these cavities, and also of the manner of insertion, condensation and finishing of the fillings themselves, because each of these phases of the subject can well be made the bases for a sufficiently lengthy and interesting paper.

SYSTEMIC MEDICATION FOR DENTAL PURPOSES.*

BY DR. ELGIN MAWHINNEY, CHICAGO, ILL., PROFESSOR SPECIAL MATERIA MEDICA AND THERAPEUTICS IN NORTHWESTERN UNIVERSITY DENTAL SCHOOL.

The subject of this paper covers such a large field that I cannot in the time we have this evening do more than touch upon a few of the more important points. There is manifestly a great lack of attention given the general system by dental practitioners. A majority of us seem to practice as though our immediate field bore no relation to the general organism, and yet we call ourselves specialists in the broad field of medicine.

The four fundamental principles upon which all successful scientific treatment must be based, no matter what branch of the healing art we are engaged in, are :

First. The condition of the part.

Second. The condition of the circulation.

Third. The condition of the nervous system.

Fourth. The condition of the alimentary tract.

Before we attempt to restore *any* unhealthy *part* we must certainly ascertain whether the conditions of the other three, *i. e.*, circulation, nervous system and alimentary tract, be such as to make it possible for a reasonably successful issue. If they be not in such a condition they should receive attention, if not first, then simultaneously with the part. In order that you may all readily comprehend my thoughts I have decided to present the subject matter in the following simple way :

1. Systemic treatment for the purpose of preventing unnecessary suffering during operations.

2. Systemic treatment as an aid to recovery from diseased conditions of the dental organs.

* Read before the Chicago Dental Society.

3. Agencies that are of value in aiding tooth development.

Patients frequently present themselves in a highly nervous excited condition, brought on by meditating upon an operation to be performed which they believe will cause them a degree of suffering far beyond their endurance.

All will admit that to operate upon an individual in such a condition will at best be very exhausting to both operator and patient, and the results accomplished can only be partially successful if not an absolute failure in its outcome.

I only need to mention the fact that the mental condition of the patient will have much to do with the degree of suffering caused. Slight changes in mind functioning caused marked changes in the physical organism. It now appears that the chemist can even tell from the perspiration the nature of the thoughts in mind during or immediately preceding its excretion. It may appear trivial to some of you when I insist that fear is a very great factor, not only in the amount of pain produced, but also in inducing grave disturbances of the whole system—disturbances which have in some instances proved fatal. It is not infrequent that adults of both sexes faint upon entering the operating room, which is simply fear carried to such an extreme that it paralyzes certain nerve centers, as it were.

Now what can be done to overcome these conditions? is our question.

First in importance will be the influence of the operator and his surroundings. The things we do to overcome these conditions are many and varied, but most of all will the influence of a kind, open heart, a pure mind and gentlemanly bearing assist us. Upon this time will not permit me to dwell, though I should like to. Second, the administration of proper nerve sedative hypnotics.

When fear is the principal factor to be treated I have succeeded admirably in many cases with trional. Trional is a powder consisting of shining scales, soluble in 300 parts of water at ordinary temperature. It is almost tasteless and odorless. From recent experiments the following can be said of it: Its effects are prompt and can be relied upon. It is comparatively safe and does not cumulate in the system. It does not produce any aftereffects that are in the least unpleasant. The system does not become habituated to it. As a simple hypnotic in all nervous conditions where pain is not a factor it is the most valuable agent I have

used, but when pain is one of the conditions to be overcome I find it less valuable than some other agents. It should be administered in doses of 5 to 30 grains, twenty minutes before attempting to operate.

Sulphonal, with which you are all familiar, possesses pure hypnotic properties without anodyne effects. It possesses advantages over the opiates in that it does not constipate, and is free from unpleasant aftereffects. It seems to act best when given in single large doses, 10 to 15 grains, for the purpose we are considering it.

When pain is a factor in the nervous, irritable condition, I get valuable assistance from lactophenin, codeine, morphine, chloral, hyoscyamus, bromide of potassium, cannabis indica, each given in proper dose, the idiosyncrasies and systemic conditions in the main determining which to use. All of these drugs are comparatively safe if you are familiar with their action, but care should be exercised to prevent any unpleasant aftereffects.

One of the greatest hindrances to the rise of our profession in the estimation of the public has been the pain produced during our operations, operations which if they be successful in their outcome, thorough in detail, must often if unaided cause a degree of suffering that makes an everlasting impression upon the mind of the patient. It is for the purpose of obviating this that I advocate the use of these nerve sedatives, hypnotic, anodynes. When these are not sufficient then I consider it wise, consistent, humane practice to resort to the use of that great Godsend to suffering, diseased humanity, namely, general anæsthetics. If you do not make use of all these agencies for these purposes, won't you? and please note the results upon your practice.

There are four general classes of pathological conditions in which systemic medication is needed in our special field :

1. Hyperæmic conditions.
2. Inflammatory conditions.
3. In neuralgic conditions.
4. In those cases where the diseased part is a local manifestation of a systemic disturbance.

Of the two forms of local hyperæmia with which we have to deal, the passive will be most aided by systemic medication ; for with but few exceptions, such as that arising from irritation to tooth pulp, active hyperæmia never rises beyond a perfectly physiological process, and when it does it rapidly passes into an active inflammation, which will be considered later.

Passive hyperæmia in the dental organs frequently occurs from a great variety of causes, all the way from simple obstruction of the veins leading away from the part affected to general lowered vitality of the whole organism, including pathological conditions of the heart where it does not exert sufficient propelling force, all of which when early recognized yield readily.

The systemic treatment must consist of: First, the use of those drugs which, acting through the vaso-motor system, will dilate the venous system, at the same time stimulating the heart directly, increasing the force and frequency of the pulse. Second, the use of those agencies that will stimulate the lymphatics to take up the exudate and throw it back into the blood current.

For the purpose of dilating the veins and at the same time stimulating the heart, I get good results from alcohol in minute doses.

Liq. Am. acetatis.....in 1 drch. doses.

Dover's powders.....5 gr. doses.

Trinitrin.....in 1 drop doses of the 1 per cent solution.

For the purpose of stimulating the lymphatics I use sulphide of calcium in $\frac{1}{10}$ gr. doses and flush the system with water.

It does not come within the scope of this paper to dwell upon the local measures that are necessary, such as heat, cold, cupping, vesication, blood letting, etc., etc.

We have in active inflammation of the periosteum and periodontal membrane and the tooth pulp, a condition of the general system with which we are all familiar. The rapid, forceful pulse, the swollen heated tissue, the high-strung nervous tension, and sometimes general exhaustion, the foul secretions, the clogged excretions, the abnormal temperature, all of which in the early stages are usually accompanied with severe pain. In all such disturbances, wise systemic medication will indeed be helpful. True, many such cases yield readily to local measures, but there are no cases of this nature where systemic medication will not be helpful and indeed many where it is absolutely essential.

In the simpler forms of inflammation in these tissues, before the stage of pus formation, to slow the blood current, quiet the nervous system and stimulate the secretions and excretions will be all that is necessary. For these purposes I get good results from tincture of aconite, veratrum viride in minim doses every half hour until relieved, tincture of gelsemium in $\frac{1}{2}$ minim doses every

fifteen minutes until 6 minims are taken, then skipping an hour, etc.

Tongaline has given me some very happy results. Sulphide of calcium used as a preventive of pus formation. Quinine is also of value.

When a nervous condition is prominent I get excellent results from Dover's powders. In addition to all of this I usually give a good cathartic and diuretic and recommend a hot foot bath and large quantities of warm water taken by way of the stomach.

In the severe forms of inflammations resulting in abscess of antrum, alveolar abscess, necrosis, septicæmia, etc., the case in hand must determine the treatment needed. In a general way the treatment just indicated will be helpful, but strict attention must be paid to digestion, assimilation, excretion by way of lymphatics, skin, kidneys and bowels, and when any one of these is sluggish it should be stimulated by the means best adapted to the case in hand. Don't be fixed copyists, but prescribe for the conditions before you. I have been consulted in many cases where dentists were failing to effect cures, simply because they did not recognize that the vital forces were so reduced that the reparative processes were stagnant. One very simple case may aid by way of illustration:

A case was brought to me where several teeth had been removed preparatory to inserting a partial plate. The wounds where the teeth had been removed refused to heal, although they had been carefully cared for. The patient was a lady, thirty-eight years old; thin, an entire absence of color in her face, languid, skin dry, temperature 102°, suffered from chronic constipation, odor of urine readily noticed from the body, pulse slow and thready, suffered from headache continually. Pus in the tooth sockets, but no necrosed bone. She was given some gelatin coated pills, each containing

Ext. cascara sagrada.....	grs. ij
" belladonna.....	" $\frac{1}{16}$
" nux vomica	" $\frac{1}{8}$

which are put up so nicely by Parke, Davis & Co. She was instructed to take two after each meal the first day, one after each meal the second day, one night and morning the third day, etc. Her diet was beefsteak, eggs, cereals and fruits, with frequent liquid drinks between meals. Gentle exercise in open air and fre-

quent cool bathing and rubbing advised. She was given an anti-septic astringent mouth wash and the sockets frequently cleansed. After three days she showed marked improvement, and in two weeks was dismissed, but was instructed to continue the pills at less frequent intervals for twenty days longer. I have since learned that her gums healed readily, and incidentally her chronic constipation was cured. That we often treat many conditions locally when they wholly depend upon systemic disturbances for their causation is unquestionably true. In this broad field there seems little that is well worked out. We understand well the syphilitic mouth, the mercurial ptyalism, the phosphorus necrosis, lead poisoning, etc., but how little we know of the constitutional causes that predispose teeth to decay, pulps to die, the roots of permanent teeth to absorb, peridental membranes to separate from teeth, etc. That we must look to the constitution for the secret seems to be unquestionable, and that along the line of malnutrition seems evident.

Teeth many times, though weak in structure, withstand the progress of decay throughout a lifetime, while teeth of perfect structure and calcification are ruined by its ravages before maturity is reached. It seems evident to me that the general systemic conditions have much to do with the progress of decay as well as the progress of any disease dependent upon *germ life*. In a life where all the functions of full nutrition are perfectly formed there is a remarkable absence of all these disorders, and when we can spare a little more time from the mechanical and turn our attention a little more along these lines, we shall learn to often prevent the destruction and decay of tissues with which we have to deal, remembering that every perfect cure must eradicate the cause.

In treating those obscure facial neuralgic affections which are not dependent upon diseased pulps, the treatment must be in accord with the general systemic conditions. These affections rarely occur in any but neurasthenic or anæmic individuals, and are sometimes confounded with reflected pains from a great variety of disturbances. When the cause lies in a tooth pulp or peridental membrane, to simply remove the irritation will not always prove sufficient, for the nerve tract often continues to transmit sensation after the irritation is removed. For the purpose of relieving this condition I get valuable assistance from fluid extract of tonga, an-

tikamnia 4 $\frac{3}{4}$ grains, and codeine $\frac{1}{4}$ in combination, quinine and salophen.

I do not wish to enter deeply into the discussion of the diseases of the peridental membrane, for upon that subject much has been written of late. although very little has been positively determined, and my studies and experiments along this line are not yet completed. There are diseases of the peridental membrane both with and without calcareous deposits, dependent upon constitutional causes, and so far as I am now able to determine they seem to be of a scorbutic and gouty nature, and in addition to removing the deposits mechanically we must look to systemic medication for valuable aid in effecting cures. In those gouty conditions there is no increased formation of uric acid as many have claimed, but instead the blood is only faintly alkaline, and therefore quite incapable of holding uric acid or its salts in solution; so that at least it is theoretically true that any agent capable of assisting the blood by rendering it more alkaline will be valuable in correcting and avoiding these disorders. For this purpose I had for some time used bitartrate of lithia with apparently good results, but it often proved so irritating to the stomach, causing violent nausea and headache, that I have abandoned it except as found in the lithia waters.

For the past eight or nine months I have been using lycetol, an alkaline tartrate of dimethyl-piperazine. In the organism it seems to be converted into the carbonate, which renders the blood more alkaline. It has the advantage of being very palatable, not unlike lemonade. It can be given in quantities of 15-45 grains a day without any deleterious effect upon the stomach. The usual mode of administering it is 5-10 grains in a tumbler of water three times daily, half an hour before eating. It is a certain prompt diuretic. With it I have had several happy results, especially in those cases of swollen, suppurating gums with pockets high up on the root where there were no appreciable deposits. However, I have come to the conclusion that more can be done for these chronic cases by a well ordered dietary, aided by abundant exercise in the fresh air than in any other way. In all cases of perverted nutrition, whether it be shown in a general lowering of the tone of all the vital forces and excretions, or in a poorly calcified tooth, the best treatment will be to furnish nature with natural sources from which to draw her needed elements,

and then by careful hygienic measures aid her to extract them. How the notion that the administration of chemical preparations of phosphorus and phosphates should aid in the development of bone and dentine should get such a hold upon the minds of the profession I cannot understand. How the administration of a few grains of phosphates can supply a deficiency of phosphorus in the system when it is daily excreting not less than 54 grains is simply inconceivable. Nature always prefers to be her own laboratory, and gather from nature's sources the elements needed for her upbuilding. Better far to stimulate the system to take these phosphates, etc., from the many forms of wholesome food in which they are so abundant, and the best means of thus stimulating the system is in enforcing clean, wholesome dietetic habits, abundant exercise and careful respiration.

To recapitulate: The main thought of this paper is to show that in all phases of our special work we must learn to recognize general systemic conditions as making for or against our success, and the time is coming when to be a successful dentist we must be able to harness these straying functional derangements of the whole organism which have to do with our special fields, and bring them under the control and in harmony with nature's laws. Surely we must broaden the scope of our horizon or we cannot long be called a learned profession.

THE PRESIDENT'S ADDRESS.

BY CHAS. W. JENKINS, D. D. S., SONNENQUAE 1, ZURICH, SCHWEIZ.

MEMBERS OF THE AMERICAN DENTAL SOCIETY OF EUROPE; *Gentlemen*:—When this society was organized, its title was criticised as too ambitious.

It was thought to imply that the child might properly teach its grandmother; that the New World could be pedagogue to the Old. Upon countless occasions since there have not been wanting objectors to the term "American Dentistry." It has been often said, and said truly, that dentistry belongs to the world, and that experts of several nationalities have been contributors to its development. In view of what our countrymen have accomplished in dentistry, we may well afford to leave hypercriticism without reply. It is not too much to say that Americans have done more

to secure the practical application to dental surgery of the discoveries and inventions of the century than the practitioners of all other nations. We do not need to draw a long bow to convince the world of this ; for the world has already been convinced by the facts. The phrase, whether it be justified or not from the standpoint of literal definition, has become universally recognized. Although the conception of its meaning varies considerably, I think it not an unfair translation of the verdict (which has been rendered in many languages) to say that American dentistry stands for a thorough practical application to the art of saving teeth of all related knowledge, without regard to any kind of expense and without heed to merely speculative theories. This is the popular belief ; and it is founded, as generally received ideas usually are, on a basis of truth which, however often perverted, furnishes a strong foundation for the highest usefulness to mankind. Such a popular belief, created by the thorough and conscientious labors of many able countrymen, at home and abroad, for two or three generations, is far more than an occasion of pride ; and ought to be always very much more than a trade-mark or an exploiting lever with which to find and lift a fortune. Such a belief imposes responsibilities of no common kind, which all who bear American titles should meet with their best intelligence and skill.

Since this society was founded, the conditions of practice in Europe have greatly changed ; more in some countries where American dentists reside than in others, but everywhere perceptibly. The education of the public as to the value and necessity of thorough work has been largely due to our fellow-countrymen. Although very much still remains to be done in this direction, since sound education is always slow, yet they who can look back to a period of practice antedating the formation of this society tell us that the well to do classes in Europe, as well as the rich, are far more intelligent in the care of their teeth now than they were twenty-five or thirty years ago.

As a consequence of this, while American dentists have multiplied, the native dentists have felt the spur of competition and the inspiration of a high example, and have taken courage to demand higher fees for higher services ; while many hundreds of young men have sought the advantages of that introductory education and technical training which may be acquired in American dental colleges. Last and best of all, dental schools have already been

organized in England and on the continent, which are rapidly supplying the demand for systematically trained practitioners, who shall be at the beginning of their careers, (as has rarely been the case hitherto) more learned than expert tinkers and more capable in filling teeth than brevetted doctors of medicine.

The question naturally arises, "How do these altered conditions affect American dentists in Europe?" "Have Americans any longer a reason, beyond that of individual pecuniary enterprise, for settling in practice here?" "Is there any real service which as Americans they can render the profession or the public which cannot or will not be equally well rendered by the native dentists of to-day?"

The answer of political chauvinism to these questions is found in the laws which exclude foreigners from practicing dentistry except upon condition of extended studies and examinations in European universities and schools. With these laws, so far as they secure sufficient training for all who seek admission to practice, we can find no fault. In the United States we demand of foreigners applying for a license, the same standard of attainment that we require of native applicants. So far as these laws are shaped and enforced merely to exclude American competition, we must refer our objections to Gov. McKinley, and bide the time when politicians on both sides of the water shall see that the people are best served when they get the most benefit for their money, whether it be by the hand of the foreigner or native.

But it is not with the political chauvinist that we care to discuss these questions. Among the capable men of our profession, be they English, French, German, Swiss, Austrian or Italian, there is naturally some doubt as to the special usefulness of a class of practitioners who, being of foreign birth and training, have settled in the large towns, asking higher prices than the native dentists and claiming either directly and openly, or by implication, to surpass them in the quality of their work. I must acknowledge that it is a very severe test of candor and magnanimity for the experts of any nation to welcome the intrusion of those of another; and surely it becomes those who would justify such rivalry on the ground of the public benefit to examine well the basis which distinguishes American dentistry from that already existing or rapidly developing in European communities.

I have described this basis as a special practicalness in the choice and use of means for saving teeth.

It cannot be said that European students have been behind American workers in the investigation and discovery of histological, pathological and therapeutic facts; on the contrary, they have been the leaders and instructors of the world in this realm of strictly scientific acquirement. Dentistry in Europe has always had first access to the new revelations of science; yet it did not advance greatly, as a practical profession founded upon a scientific basis, until the advent of the less learned American dentist. It is entirely natural that this should have been the case; for the scientific investigator is loth to employ his time in working out the details of a practical application of his discoveries. He is full of the enthusiasm of research; beyond his present discovery he sees, or thinks he sees, new and brighter worlds; how can he waste his time and thought in determining the actual value of the one that he has just brought to light? Yet until this devotion to scientific knowledge is paired by an enthusiasm for the application of newly ascertained facts to human wants, it is not of much use to the world, and is likely to lead its discoverers astray into speculation. The corrective and guiding influence of actual contact with practical problems is needed to offset the charms of theory. He whose patience is wholly devoted to the experiments of the laboratory, and who grudges the time spent at the chair cannot be a first-class dentist. Familiarity by help of the microscope with the development, structure and decay of tissues is an exceedingly valuable acquisition; but it cannot take the place of the mechanical teaching of the instrument in contact with dentine, enamel and vascular fiber in the living organism.

It is remarkable that the European public did not recognize the close relation of art to science as a practical necessity in our profession, until the stimulus of foreign competition opened its eyes. In the "good old times" the court dentist had a doctor's degree and a set of instruments that was all; or, he was known as a great physiologist; or, he wrote big books compiled from the labors of many learned investigators, while he filled carious teeth with plastics solely and buried dead pulps as heartlessly as a Sadducee, who believed in no resurrection and feared no final judgment. I do not believe there is one American dentist present here, who, if he has been in practice over ten years in Europe, cannot

count by the hundreds the dead pulps that have risen from their graves, in the odor the very reverse of sanctity and wandered into his office far too late to be shrived of sin, simply because that in their lifetime the leading dentists had learned nothing more from the leading scientists than the fact that arsenic will devitalize a pulp without killing the patient. The misfortune in these cases was not due to the lack of knowledge, as to the treatment of septic conditions; Germany was full of it; it was to be had everywhere except in the brains and at the finger ends of the very men who needed to use it most, the practicing dentists. The most capable of these, at the period to which I refer, had had as jewelers, watchmakers, engravers, and the like, a thorough training in the use of tools, but had no special dental education and were so exclusively engrossed with the mechanical details of their work that they paid no attention to pathological and therapeutic conditions. They did not seek to lift their occupation above the level of a trade; they did excellent trade-work as carefully as the bee makes the cell for its honey; asked trade price and were content. They did not take the pains to keep in touch with the science of the day; to turn to account its newly discovered facts; to learn anything new outside of the technical traditions of the workshop.

Now I claim that it is a characteristic of the best American dentists everywhere, it is *the* characteristic that has won for them a world-wide fame, that they have a natural aptness and predisposition to make themselves both masters of ideas and masters of tools. They are alert to watch the continual revelations of science; are continually sifting recently discovered facts and appropriating such as have a bearing on their work, while at the same time they assiduously drill themselves in the mechanical appliances, always testing, always inventing, never rejecting any improvement because it is expensive or difficult to learn, or at variance with preconceived theories. It is this open mindedness, this broadness of view; this readiness to adopt whatever of value may be discovered by other men, at whatever cost of time or labor, or self-love, this willingness and courage to drive a shaft to the middle of the earth, if need be, to get at the solution of a difficulty that enables them to achieve much that is often called original. Yankees are believed to be an inventive race, which is to some degree true, but it would be nearer the absolute truth to say that they are not afraid to learn from anybody; that what they do

learn, they immediately apply to new uses. The originality lies in the practical adaptation of knowledge from every quarter.

Let us be modest and admit that we do not invent everything; that the French have an acute scent for an obscure fact; that the English have a common sense judgment that is worth more than much learning and skill, though they be not behind in these; that the German will sit up all night and work Sundays to substantiate his theories; yet still there remains for the American this rather unique restlessness; this untiring eagerness to improve, at whatever cost; this intense wish to secure the latest and best results of scientific research and turn them to practical account. The price of improvement is untold patience, humility and sacrifice, hard work of body and mind. Yet one may pay that price and make very little advance if he has not a progressive temperament; if he has no natural quickness to recognize the value or worthlessness of proposed new methods. It is because the American has this eager receptiveness, this progressive spirit ruling his blood and brain that he is especially adapted to succeed in the dental profession, and has contributed so much to its practical development. For this reason I believe that his presence in Europe as a professional rival will continue to be in the twentieth century valuable to the public, as it has been in the nineteenth, by supplementing with this inborn aggressive progressiveness the qualities possessed by the native dentists. The tendency everywhere is to let the standard sink to the level of the popular demand, to compromise with the unwillingness of the public to pay for the best work, rather than to push the standard higher at some present personal loss. To combat this tendency the American has the advantages of the national *prestige*, of the national tradition and temper. If he remains true to these advantages, they will not fail him; if, however, he remain content to do as others do, he can neither serve the public well nor benefit himself.

In making these remarks, I have not forgotten that an increasing number of our European colleagues are aiming with success at the same mark as that which I have designated as distinguishing American dentistry. Wherever we recognize such agreement of effort, we bid it Godspeed! Especially do we give hearty welcome to those who have not only learned in the United States those rudiments of dentistry which it is possible to acquire in a dental college, but have also imbibed during their residence there, some-

thing of that which we name vaguely, but perfectly understand, "the American spirit," and who are laboring with us in the great work, still only begun, of lifting the profession in Europe to the high plane to which it is entitled.

Gentleman, I leave off as I began, by declaring that American dentistry stands for the thorough application of scientific knowledge to the perfection of skilled labor in saving teeth, without regard to expense of any kind, and without heed to merely speculative theories.

TIN AND GOLD.

BY WILLIAM A. SPRING, D. D. S., DRESDEN, GERMANY.

Mr. President, Gentlemen:—I propose to present to you to-day a subject which is not new, having been introduced to the profession by the pioneer of dentistry in Germany, Dr. Abbott, of Berlin, and advocated by many able men since. I do so in the belief that with a certain change which I have made, I have removed the objections which have prevented a more general adoption by the profession of this filling material, tin and gold. I claim that a combination of these two metals used in correct proportions has, for a large number of cavities, advantages not possessed by any other gold. Softness upon introduction, rapidity of insertion, absolute adaptability without the necessity of bringing the plugger near the walls are qualities it possesses similar and in an equal degree to noncohesive gold. In one respect, however, it is quite different. You are all aware that strictly noncohesive gold fillings do in many cases crumble and waste away, and that upon their introduction a beautiful, hard looking surface is seldom secured.

How many of us would gladly have used it because of its tooth saving qualities and its rapidity of insertion, but have been deterred by this serious objection! The surface of a tin and gold filling can be finished as smooth as a cohesive plug, and it remains smooth and unharmed by any amount of wear. The great resistance to wear possessed by this material is due to a hardening process which takes place during the first weeks after its insertion. Prof. Miller has described this as due to an electrochemical action, by which a part of the tin is dissolved and re-deposited upon the gold. Upon this hardening depends largely the strength of this combination.

It remains for me to speak of color. Tin and gold in the proportions generally used do not present a pleasing color. When finished it looks but little better than tin, and after a short time it grows dark, and sometimes black. I am convinced that this fact has been the greatest hindrance to its introduction to the profession. Many have tried to help this by putting in frequent pieces of pure gold. Such a filling is even less presentable. The tin and gold grow blacker than usual, while the pieces of pure gold stand out bright and yellow, causing a patched appearance. I recommend five parts of gold to one of tin, prepared in the following manner: Lay down one sheet of Abbey's noncohesive gold foil No. 6; upon this place a sheet of No. 4; upon this a sheet of S. S. White's globe tin foil No. 4; upon this another sheet of Abbey's noncohesive gold foil No. 4; and upon this a sheet of No. 6. Cut into five strips and crimp. The crimped strips are cut into pieces a little longer than the depth of the cavity to be filled. Some of these pieces are rolled into cylinders between the thumb and finger. Others are left open because easier to use in starting a filling. The color of this combination is slightly less yellow than pure gold, but thoroughly pleasing and satisfactory. This combination hardens just as rapidly as when the proportions are one to one. An accurate test would probably prove that it does not become quite so hard, but the difference is so slight that with an excavator you cannot detect it. Suffice it to say it will stand all that is required of it in the mouth, as experience proves.

This preparation is strictly noncohesive, and should be inserted by the wedge process. It is advantageously used in grinding surface cavities of molars and bicuspid, in small buccal cavities of molars or bicuspid, in cervical fissure pits of lateral incisors and in approximal cavities of molars and bicuspid. If the approximal cavities are large and opened from the grinding surface, the last portion of the filling should be of cohesive gold to withstand mastication, for it must be remembered that the filling is very soft when first introduced. In simple cavities I place as many pieces as I can easily introduce, using my pliers as the wedging instrument to make room for the last pieces, and then condense the whole. If the cavity is too deep for this it requires an intermediate. Fletcher's artificial dentine is excellent for this purpose. A piece of asbestos saturated with cinnamon oil and this covered with Robinson's fibrous tin is good, and very quickly

placed. This intermediate is specially useful in broad cavities in molars, because the ends of the tin and gold cylinders stick to the tin, and thus render the use of an assisting instrument superfluous. The advantage of this material over pure gold in large approximal cavities of molars and bicuspidis is very great.

After the cavity has been prepared in the usual manner, a matrix should be applied. I prefer a thin piece of German silver, held in place by two wedges of orange wood placed between it and the next tooth. I consider a matrix essential, for otherwise the force of condensing is not confined, and the result is a loose filling which could disintegrate. Such a cavity, when the matrix is placed, becomes a simple cavity, but usually very deep. I use cylinders only one-eighth of an inch long, and condense in two or three layers to assure perfect adaptation. Hand pressure is the principal force used in condensing, but in such cavities a few firm strokes with a hand mallet are useful. When ready to add the cohesive gold which forms the grinding surface, a few pieces of S. S. White's crystal mat gold should first be used, because it adheres beautifully. This secures a perfect union, though I have never risked adding pure gold without leaving a little undercut for it in the tooth. In this manner we obtain a beautiful contour filling in a short time. The tin and gold should be burnished and then polished with a fine strip or moistened pumice on a linen tape. This requires but a few minutes. How different it is with a cohesive plug. It is needless to dwell upon the longer time necessary to insert it, and the danger of marring the delicate walls. With that you are all too familiar.

I desire here to call your attention to the difference in finishing. With a cohesive plug a satisfactory surface is only obtained after a long and tedious process; but the time and pain are not the only objections. I think I will not be criticised for stating that in many cases the enamel walls, already thin near the cervical margin, are made thinner by the unavoidable friction of the polishing strips. Tin and gold is so soft that the required surface is obtained in a few minutes, and this danger is reduced to a minimum. The surface is as smooth as you can secure on a cohesive filling, while such a surface is impossible with noncohesive gold.

I do not wish to speak disparagingly of soft gold fillings. They have too good a record for saving teeth. I wish merely to emphasize the fact that whereas soft gold fillings do in many cases

become ragged, tin and gold takes a smooth finish, and does not become ragged.

There is one more use of tin and gold which I would like to mention. We sometimes have cavities which extend so far beyond the margin of the gum that it is impossible to adjust the rubber dam. Such places are universally recognized as difficult. Many have described their methods, and the one most adopted I think is to fill the first third of the cavity with amalgam, and when this has set, apply the rubber dam and complete with gold. I have never heard my method advocated, but it is easier and quicker than the one just mentioned. After preparing the cavity in the usual way, I adjust a matrix. I then dry and disinfect the cavity, and fill one-third with tin and gold. The matrix acts as a dam to keep out moisture, but should moisture get in, the filling is not harmed in the least. The matrix is then removed. As you will perceive, it is now very easy to apply the rubber. The matrix should then be placed in position again, and a little tin and gold added, when the rest of the filling may be continued with pure gold. In this manner the filling is completed at one sitting. The tin and gold under the gum is quickly and easily burnished, and no further finishing of that portion is necessary. The beautiful golden color is best brought out on that portion which will afterward be seen by the use of pulverized pumice. This is equally true of grinding surface cavities, where the pumice may be best used on a moose hide point.

A DESPERATE CASE.

BY CHAS. RATHBUN, D. D. S., LONDON, ENGLAND.

The short sketch I propose giving you is not by any means worthy the name of a paper, much less to be preserved among the archives of this society. In fact it is little more than a confession of failure on my part as a dentist and an appeal for help from you as to my future treatment of what to me is a sadly interesting case.

The history of this case I will now lay before you. This patient's teeth have been under my care for over twenty years, and I have succeeded in inducing him to be present at this meeting, to submit himself to your examination in the hope that some one among your number may at least offer some suggestions or map

out a line of treatment to be pursued, that he may if possible preserve his remaining teeth, some of which I may say are decaying in precisely the same manner as the one he will submit to your inspection. This mouth was originally in the hands of my brother, Dr. B. Rathbun, of Dunkirk, N. Y., who extracted the superior first and second molars on either side. How far the loss of these supremely important teeth has militated against the durability of the remaining teeth, is a question I am anxious to have your opinion on. At the time of the extraction of these teeth, the mouth was put thoroughly in order, many of the stoppings remaining in good condition and fulfilling their mission after a lapse of twenty-three years.

The first work I did in the mouth was the treatment and stopping of the roots and crown of the lower left six year molar which I may observe is in good condition at the present time. My next operation was the insertion of a gold crown on the right second lower bicuspid. This also is now in good shape. The other teeth in the mouth have been carefully stopped from time to time.

The patient removing to Europe about the time of my commencing practice in London, the mouth was still under my control.

About seven or eight years ago a recession of the gums was noticed between the lower central incisors. Careful scaling and treatment with sulphuric acid has kept this trouble fairly in check. Simultaneously with the absorption of the gums at this point, deposits of serumal tartar were noticed on all the teeth, more or less.

This was carefully removed with very small highly tempered scalers from time to time and the gums treated with peroxide of hydrogen and dilute sulphuric acid, the surfaces of the teeth as high up as possible being polished thoroughly with fine pumice.

I go at some length into these details to show that lack of attention on the part of either operator or patient cannot be the explanation of the trouble with this man's teeth. In addition to his having the best help I could give him, I have not hesitated in the event of my not being able, for any reason, to attend to his teeth, to put him for the time being under the care of the best available operators, to keep the ravages of decay in check and to supplement and reënforce, no doubt to the patient's decided advantage, my own efforts. In fact our own President has two or three monuments to his skill as an operator in this mouth. Beautiful work has also been done by Dr. Croll, Dr. K. Davenport, Bergstresser, of Abilene, Kan., Doherty, of Columbus, Ohio, and others.

In fact it speaks far more I fear for the patient's loyalty than his judgment, that, no matter to whose hands I transferred him temporarily, he always in the event of anything further being required, submitted himself to my control. I might casually mention that the cult of the therapeutic action of the prophylactic toothbrush finds in him a zealous follower, as only last week when I was impressing upon him the vital necessity of thorough cleanliness of the mouth, he remarked that that very morning his wife had returned to their room and said to him: "For goodness sake leave off scrubbing your teeth and come to breakfast."

About three weeks ago he complained of an unpleasant taste in the mouth and I gave him a thorough examination, but discovered nothing special. Advantage was taken of the sitting to go carefully over the teeth to remove any deposits of tartar that might have made their appearance since the last visit, when it was discovered that on the disto-lingual aspect of each superior second bicuspid well under the gum, which seemed healthy and firm, there was a large cavity, that on the right side of the mouth running two-thirds around the tooth and involving so much of its structure, that I despaired of saving it. It may be as well to point out right here that owing to the loss of the adjacent molars twenty years before, the cavities could not have been in a more accessible or self-cleansing position. In fact, the decay is so serious, and in spite of the watchfulness of the patient as well as myself, that after consultation with Dr. Davenport, I determined to do nothing, but if the gentleman would come before you, to submit him to you and ascertain the opinion of those present as to what is best to be done. The patient remarked coming over on the boat that if it seemed to be best to have the teeth extracted, he would allow it to be done, although in that case he would prefer that it be done by Dr. Davenport or some other fairly muscular person, rather than by your humble servant. I have proposed to fit bands to the bicuspid and wisdom tooth, solder them together, and if after extraction it were found that the tooth could be stopped it could be replanted and held by the bands securely in position, or another bicuspid could be implanted in the place of this one, as the bicuspids and two small badly occluding wisdom teeth are all the grinders he possesses in the upper jaw. A partial plate—well, the boy at boarding school when pressed for a reason why he would not eat sausages, said, "Please sir, we makes 'em," and with my ex-

perience of the effect partial cases have on the remaining teeth am chary of inserting one in a mouth such as I have described. A bridge means the mutilation of two of the five grinding teeth in the upper jaw.

Now gentlemen, I fear some of you may think this a deal of sack to a bit of bread. However, I shall trespass on your good nature just enough further to say whenever any of you are ready to examine this case I will sit right down and let you do it.

THE MISSION OF THE MATRIX.

BY DR. G. C. DABOLL, PARIS, FRANCE.

Twenty-four years ago in April Dr. Louis Jack, of Philadelphia, brought to the notice of the dental profession in an article which appeared in the *Dental Cosmos* of that month a device for aiding the filling of approximate cavities which for want of a better name he called a "matrix." In this article Dr. Jack described his device and dwelt strongly on the advantages to be derived from its use, explaining in detail its form and application, the manner of its retention and the entire operation of filling a cavity with its aid.

The description was very clear, precise and intelligent and the writer very positive in his conclusions that the device was a valuable aid to the operator in surmounting difficulties that up to that date had troubled the most skillful to overcome. The article attracted but little attention generally and only a very few were impressed seriously enough to make a trial of the new device and of these still fewer adopted it as an adjunct in their operations. Its use was not taught in the dental schools, consequently students were not impressed with its value. The older men in the profession were slow to adopt innovations and the younger men were influenced by the opinion of their elders. Thus years went by and the matrix was practically a dead letter. There were a few, however, who appreciated it and discovered with little delay its true value, and in the course of time through the medium of articles that have appeared in our journals and by practical clinics before dental associations the matrix has at last found its true place in the cabinets of the best men in our ranks.

In my own experience I have found true all that its inventor claimed for it and even more; time and experience having

developed possibilities unknown twenty-four years ago. Yet there are many who deny that these advantages exist and that the matrix, especially in gold fillings, is not reliable. It is claimed that it is not possible to make a surface with gold packed against polished steel that will be smooth or will finish smoothly. It is also claimed that gold cannot be packed to the margins of the enamel in the angle formed by the junction of the matrix with the tooth with that certainty required to make a perfect filling margin. Still further the assertion is made that a correct contour is impossible with the matrix. To all of these objections I have only to say that they are easily obviated by the proper adaptation of the appliance and the employment of suitable instruments for packing the gold.

The plugging instrument is an important factor in the operation and there should be a set of what might be called matrix pluggers. These should be in pairs, rights and lefts, anterior and distal, each pair different from the other in its angle and curve, the point being beveled either forward or backward and in packing the gold the long side of the point should be kept constantly in contact with the matrix thus insuring the consolidation of gold at the surface of the matrix. This secures perfect adaptation at the margins in the angle formed by the contact of the matrix and the enamel at both side walls and cervical margin. It is understood of course, in speaking of the cavities of decay that what are known as compound cavities are referred to, that is to say proximal cavities in which there has been a loss of the enamel at the grinding surface. Where there is no such loss involved, sufficient of the grinding surface must be removed to insure free access to every part of the cavity. There should be strong cervical margins with no groove or undercut, the side walls grooved slightly where it is admissible, but in any case the cavity must be generally retentive in form. One can successfully pack gold in a proximal cavity with less radical cutting, by the aid of a matrix than without, only slight grooves and undercuts being required if they are thoroughly utilized at every point, retaining pits are as unnecessary as they would be in a favorable crown cavity. For greater convenience one should have a variety of sizes to conform to the different teeth in the variation of their size and length of proximal surface.

It not infrequently happens that the extent of the caries is such that the matrix can be adjusted without the necessity of wedging

for space but that necessity may still exist for requirements of finishing. Wide separations are not required for successful operations with the matrix. All the space needed for finishing can be obtained in a few minutes with a Perry separator. The application of the matrix is undoubtedly the stumbling block of the majority of those with whom it has not found favor, and next to this the lack of suitably shaped instruments for packing the gold. Thin wedges of orange wood dipped in sandarac varnish will be found most reliable for retaining it in position. The matrix should be used for all compound proximate cavities whether anterior or distal. The more it is used the more skillful one becomes in its use and the more positive in its appreciation.

It is equally valuable in the introduction of amalgam, gutta-percha and oxyphosphate fillings. This may seem a groundless assertion, but in view of the fact that the principle remains the same, I shall let it stand without discussing it. The matrix simplifies the operation whether one material or another be used.

In ordinary operations involving only the proximate surfaces I prefer Jack's matrices to all others. I have found but little satisfaction in the various band matrices for simple proximate cavities, but for distal cavities in second molars where the wisdom teeth are missing they are valuable but not easily applied and retained in position with difficulty owing principally to the fact that the shape of these teeth is variable.

I prefer generally to make a matrix for each individual case by making a band of copper ribbon and soldering the ends together, fitting as accurately as possible and retaining with a wedge dipped in sandarac varnish, driven under the band and the buccal surface of the teeth. There is no limit to the application of the matrix in one form or another and whatever form it takes its mission is always the same—simplifying complex conditions and insuring and perfecting results. With the matrix there is no longer such a thing as a compound cavity, it is a crown cavity, not a simple one perhaps, but one which is always under control. Thus with a cavity correctly prepared, the matrix properly adjusted of the size and shape demanded for the special conditions of the case, with instruments adapted in size, form and shape of the points for carrying and packing the gold to every part of the cavity, there is no reason why every dentist should not be able with intelligent careful application to produce durable, artistically fin-

ished proximate fillings with the minimum exercise of physical and nervous force to both patient and operator.

And this is the mission of the matrix—to give certainty where there might be possibility of a doubt; to lessen fatigue by infinitely diminishing obstacles to be overcome, to make possible that which in many mouths is otherwise impossible. Everybody knows what the mission of the rubber dam was and what a boon to suffering dentists and their equally suffering patients; second, only to that in importance and value is the mission of the matrix.

CROWN AND BRIDGE WORK.

BY J. P. CARMICHAEL, D. D. S., MILWAUKEE, WIS.

The subject which I wish this Association to consider is Crown and Bridge Work.

To properly consider the same, it might be well to classify it as follows:

First. The education of the people to a knowledge of the necessity of saving their teeth, even though the crowns are badly decayed and broken down, so long as the roots remain firm in the jaw and the gum healthy, they can be restored to greater usefulness than any artificial teeth.

Second. The natural method or support for artificial teeth.

Third. The importance of constructing a bridge or crown so as to insure absolute cleanliness, which weights upon healthy gums.

Fourth. The practical points to be observed in the construction of bridge and crown work.

Fifth. The restoration of the mouth and the teeth more fully to their normal appearance and usefulness.

The process of restoring or replacing badly decayed or lost teeth, by crown or bridge work, is to-day universally conceded to be the most serviceable method yet devised, which not only delights the patient, but brings reward to the dentist, who is capable of performing this class of work with success; and which really requires more ingenuity and skill in the operator than any other branch of dentistry. The old time dentists as well as the new, recognizing the great service of crown and bridge work, have set about saving as many teeth as possible

in the preliminary work, in the hope of substituting at a future day with bridge and crown work; the result of which is the gradual doing away with the nasty plate, which is alike repulsive to the wearer and a source of constant dissatisfaction and annoyance to the dentist who has constructed it. In my personal experience where a partial plate is worn I have frequently found it almost impossible to save the remaining teeth, owing no doubt to the irritation of the unhealthy secretions, producing decay, and a general breaking down of the teeth. In every case where I have been obliged to substitute a plate on one jaw, with a bridge on the other, my patient has said "If I could only have a bridge in the place of this miserable plate I would be delighted."

And how often we are obliged to listen to a complaint against the dentist who extracted their teeth, when, in after years, they awoke to the fact that their teeth might have been saved and put in good order by the modern science and art of dentistry. I am of the firm belief that the dentist who is unfitted for this special branch of dentistry will lose the better class of his patients, for in these days more is required than simply being an expert in gold work. The successful bridge and crown operator must be an expert in the rescuing of teeth from all the diseases to which they are subject. According to the laws of nature man never was intended to masticate with his gums. All such constructed artificial dentures resting upon the gum cause more or less disease of the membrane that is so covered, producing unhealthy secretions with absorption of the alveolar process, to an unnatural extent. I will also state that I have never seen a complete set of artificial teeth, where the food was thoroughly masticated. But certain kinds of food, a piece of meat for example, having been taken in the mouth would be rolled about, squeezed between the teeth and swallowed in a mass. With all my dislike for the plate, it has of course served a good purpose, and we are compelled to resort to it where bridge work is not practical. On the other hand, bridge work supported as it is upon the remaining natural teeth or roots of teeth, is as firm in position as the natural teeth themselves, serving the purpose of mastication in many instances equally well. It may and will tax the skill of the operator to build a bridge strong enough to withstand the force of mastication and at the same time be so constructed as to allow them to be properly cleaned. I hope

that in the near future we may have a tooth manufactured, strong enough to answer the purpose of this class of work, which at present is one of the most troublesome features we have to contend with. Porcelain facings even though well covered with gold so as not to strike the opposing tooth, will occasionally when biting a hard substance split from their pins, leaving the latter exposed. I have found that the S. S. White facings with long pins are the best to use, and in the event of their breaking, the bridge can be repaired while in the mouth. Where short teeth are found necessary, and are broken by a close bite, the porcelain facing can be replaced in the following manner: By drilling two oblique holes through the gold backing to receive the pins, bending the pins apart to secure the facing (instead of clinching them as is often done) then fill the remaining holes with gold and finish; the tooth will be as secure as a new case. A bridge so treated and carefully finished on the back, cannot be detected as having been repaired.

I have accompanied this article with a specimen case of the method which I have applied in my practice during the last eight years, having entirely discarded the use of gold bands, and making it a special point to allow no gold to show to indicate the insertion of porcelain teeth. The necessity of this attachment, as you will see upon this model, dawned upon me as the best fastening for such teeth as were too good to cut off and crown, and which is sufficiently strong for all purposes, to be far preferable to capping the entire tooth with gold which has been a common practice with many dentists; with carborundum wheels and enamel burs I cut grooves as you will notice in the model, allowing so far as possible for the thickness of the gold on the occluding surfaces. I then take a piece of pure plate gold about thirty-four gauge and burnish the same over the inner surface and setting well into the grooves, forming the shape of my attachment; then flowing coin gold over this to the thickness desired for strength, the fastening is placed upon the tooth and properly articulated before taking the impression. As I have already said I have used this method for the past eight years with decided success. I find when these fastenings are carefully put to place with some good cement (I prefer the Justi) they are as durable and strong as could be made by crowning the tooth. Strange as it may seem to some, I assert that to do this work in the mouth is more satisfactory to me, and I never have failed to make equally as tight fittings as is shown by the

model, which, after cementing to place, give a perfectly air- and water-tight union.

My experience has been that to cover the entire crown of a tooth with a gold cap means sure death to the pulp sooner or later, which perhaps is due to the shutting off of the natural external influences that are necessary to determine the nerve and blood forces that nourishes it. To keep a bridge clean the fittings must be made close, and liberal spaces at the neck of the teeth, directing the patient to at least once a day pass a silk thread over and between the teeth and gum. With a good brush and a flexible quill pick all particles of food can be removed. The importance of all this must be thoroughly impressed on the patient, which, if heeded, will not only afford you great pleasure next time you are called upon to examine the teeth, but you will say bridge work is certainly a success. In conclusion of this much written subject I can safely say that the dentist who successfully performs these operations will have the satisfaction of hearing words of praise from his patient, acquire fame as a skillful and progressive operator, and be on the high road to secure a competency for his old age.

THE ADVANTAGES OF A SYSTEMATIC TRAINING IN MECHANICAL DENTISTRY.

BY GEO. CUNNINGHAM, M. A., D. M. D., L. D. S., CAMBRIDGE, ENGLAND.

The subject on which I have undertaken to read a paper is the advantages of a systematic training in mechanical dentistry. The importance of such a training it is impossible to exaggerate. I think it is the experience of us all that the conditions of mechanical dentistry are eminently unsatisfactory. We are all more or less cognizant of that, and we suffer individually and collectively. The difficulty in obtaining skilled mechanical assistance is notorious and affects us keenly as individuals. Collectively we also suffer, because even if the advertisers, the so-called quack dentists, are to do mechanical work for the public, it is better that their work, even if illegal, should be well done, than that it should be badly done. After all, the public will be a long time before it can discriminate between the two classes of practitioners, while it is quick enough to see the difference in the quality of the work which is turned out.

Again there can be no question but that the patient is much

quicker and readier to recognize defects in mechanical cases than in operative work.

As this condition of mechanical dentistry is so notorious, what steps can we take to improve it? I think we must first recognize the cause of this condition, for there was a time when the work of the mechanical dentist was in fact the best—one might almost say the only dentistry. The cause of the changed condition in these days I believe is simply due to lack of training, lack of efficient teaching both in schools and in private laboratories; and that first, from the time of the dentist being more identified with the surgery than the laboratory, and from the facilities afforded by the modern dental depot.

The immense progress of operative dentistry is due to a systematic teaching of the art, with a complete curriculum, embracing not only the subject itself in its various aspects, but also sound teaching in all those medical and scientific subjects which enable a practitioner to exercise his special art on intelligent and scientific principles. It may reasonably be supposed that similar progress would be made by laying down a curriculum for the art of mechanical dentistry, the chief feature of which should be a maximum of laboratory work, and a minimum of didactic teaching. Before the student can become a dental mechanician, he should first be a good mechanic pure and simple, also something of an artist; not necessarily able to paint an academy picture like a Tomes, nor to sculpt bust like a Kingsley, nor to etch like a Stark, nor to execute a *chef d'oeuvre* in *repoussé* work like a Foulks, but thoroughly imbued with an artistic sense of appropriate form and color as applied to the region in which he has to work so that the appliances with which he has to restore lost parts of the human frame, may conform to nature and not offend the eye, for the restoration of lost function is inefficient, if æsthetic qualities are not combined with utilitarian. It may be laid down as the first principle that he should be a mechanic. Therefore I maintain that he should have the same general and preliminary training in mechanical arts required alike by an engineer, a scientific instrument maker, a jeweler, or an electrician; in fact a general manual training in wood and metal work, with exercise in drawing and modeling. At the same time he should be acquiring sound instruction in physics, chemistry and metallurgy in order to learn the scientific principles underlying manual processes, which are as necessary factors in the

mechanical curriculum as histology, pathology, or therapeutics in the operative.

In considering the practical embodiment of such a curriculum, I must restrict myself almost entirely to looking at the matter from the conditions and exigencies of my professional environment; viz., those imposed by the dentists' act in Great Britain and Ireland, and the way in which it works in that country.

The British curriculum has differed very much in the matter of mechanical training from that in force in the American and the continental schools, inasmuch as it has made a great feature of requiring for the purpose of learning mechanical dentistry, a three years' pupilage for the dental diploma (L. D. S.)

I know, and others know also, good practitioners with whom such a pupilage has proved a satisfactory training of lasting value. Moreover, it is a notorious fact that many a dentist, who in his early career was a good mechanic, owes his success as a dentist to the fact that in time past he was neither more nor less than a mechanical man at the bench; yet he has become an operative dental surgeon, and many of such men have proved very good operators indeed. In the present day the son has not the advantages which made the father. The father thinks if he had only had the privileges of a medical qualification, what a great man he might have been, and consequently the son gets his three years' pupilage written up, which is all a farce and humbug, not confined to sons of dentists. He goes to the medical and dental schools, or it may be the university, and there his dental training is sacrificed in order to gain knowledge and training in medical matters, most of which he will rapidly forget. When he has at last obtained the coveted titles, he may seek a situation as an assistant, when the unfortunate employer finds that the triply qualified—medically, surgically and dental—is not fit to earn a good laboratory boy's weekly wages. Unfortunately the exigencies of the operative dentist have become so great that he cannot give sufficient time to the training of the pupils in the laboratory; and for the greater part of the time the lads are left to themselves, or to the care of a mechanic who has no direct interest in their advancement. In some of our schools they have undertaken to manufacture artificial dentures for the sake of giving their students an opportunity of gaining the experience in processes which they ought to have acquired in their pupilage before entering the school of

operative dental surgery. Mr. Watt, the teacher at one of these schools, says that out of 200 students who have passed through his hands, only 14 per cent were really good mechanics, 46 had a fair knowledge, and nearly half had but a slight insight in these principles, an accurate knowledge of which is so necessary to insure success in after life. The point then which we must consider is how to rectify this condition. The dental laboratory of the private practitioner is a school only in a secondary sense. It is necessarily a place where the commercial aspect of the work is predominant, and in many cases, the nature of the work is subordinated to that fact. It may provide a good secondary or finishing training, but it cannot give that primary instruction which we deem essential.

We know that men are not perfect, and therefore there are no perfect dentists ; we know that there are numbers of our profession who take a fee for pupils without ever giving them an adequate return. Hence the proposition has been made that the present dental schools should make provision for the pupilage in mechanical dentistry. I for one, knowing our schools as they exist in England, would be opposed to the idea of our schools taking it up. Because the English school is started like most of the other medical schools in England, primarily as a charity, and only secondarily as a school. Now all one wants is to be able to control a sufficient number of cases of an educational character. And further, we must have for the adequate teaching of mechanical dentistry, not only a sufficiency, but a variety of cases of a high class character, such as plate work, continuous gum work, etc., which can never be fully provided by the dental appliance department of a charitable institution.

I have looked with a great deal of interest at the teaching of mechanical dentistry in American schools. I have before me the schedule of work required in the mechanical laboratory of the Dental Department of Buffalo University, and I think it may be taken as a type of what may be taught in a good American school, where mechanical dentistry is dovetailed, as it were, with operative work. It is quite true that the list of work is great and comprehensive, but I have been searching through that schedule to find out any system in it, and there is none. It fails also to provide that primary instruction in mechanical technics which I ad-

vocate, and which is equally important or more so than the so-called operative dental technics.

Several years ago I made up my mind that I would never take another dental pupil in my laboratory, but soon after that I became interested in the larger question of technical education in general. My attention was drawn to some of the investigations then going on. I determined to do what was possible with the help of Professors Stuart and Lyon, who had started and developed against considerable opposition, a school of engineering in the University of Cambridge. I got them to agree to take my pupils. I recognized that, inasmuch as in my laboratory I employed ready made goods, the dental laboratory was no longer the training school that it had been in the old days when practically everything had to be made, tools, materials and appliances; and those were the days when we had the good workmen. We cannot bring back those old days, the bone age of dentistry. We do not want to go back to the apprenticeship system, with its six or seven years of drudgery, but we can modify these conditions to suit our modern environment, where it is more convenient and economical to buy than to make the materials we confect into dentures.

Now after this preliminary manual training, instead of having a raw lad with whom one has a great deal of trouble in the work shop, you have a student who is something of a mechanic, with a knowledge of a good many mechanical processes, and who is quick in acquiring a knowledge of the special work and processes of the dental laboratory.

I would like to explain why so many years spent in doing the one kind of work is worse than drudgery. It takes a long time in any laboratory before the boy gets away from that. The first few times he runs a plaster impression; the first few times he makes or casts a die in metal he is keenly interested; but with endless repetition his mind becomes free to wander and his action mechanical, and it may be that he is thinking of his best girl or where he is going to pass the evening, but in any case his mind is far from dentistry. Instead of this unvaried monotony, give this lad a series of exercises to perform, say of dental interest; by that I mean work of this kind to do, making an articulator, a bellows, blow pipe, a chisel, and so on, and in that way you gradually get that brain-working and developing *with* the hand, and the result is that though apparently you do not let him touch a purely dental exercise

for some months, when he does get there, he makes more progress than the lad who has simply been trained up in the ordinary way. For many years I read papers on the subject, but was forced to the conclusion that it was a hopeless case to achieve any tangible reform in that way. After long study and examination of the methods of the modern technical institute, a similar scheme for an institute of dental technology was prepared and I tried to get my colleagues to take the matter up as a profession. I wanted them to found a complete school of mechanical dentistry, the capital to be provided by dentists, and sufficient in amount to provide paid teachers. I think it is a shocking thing that we have not a single man in England who is yet able to earn more than a mere bread and butter wage in teaching dentistry. Our present schools have marked their appreciation of the teaching of mechanical dentistry by neglecting to place the instructor on a level with the other teachers through not giving him a voice in the conduct and government of the school; and why, forsooth, simply because he is receiving a definite salary and gives up his whole time; whereas they give but a small part of their time and participate in an uncertain division of teeth.

A certain number of my colleagues have assisted me in carrying out the ideas embodied in this paper. We have taken a studio in London, and you will see from this syllabus, which I am passing round, the scope of our scheme. I think we are on the eve of getting something like a mechanical curriculum, just as we have a curriculum for dental surgery. Another feature worth attention is the fact that any student failing to pass satisfactorily the probationary three months' manual training course is rejected as a curriculum student and advised to seek some other calling where manipulative skill is not a *sine qua non*.

I have brought a few samples of the kind of work done under the technological system, some general, some artistic, and some dental. Here is a little piece of work which has been done in Cambridge by a lad, in *repoussé* work. This illustrates what I said with regard to giving the student a sense of form and shape and color, and is a sequel to modeling in clay. It shows how we endeavor to make him something of an artist. I here show you a kind of application of what I would call "art applied to dental purposes." The other work consists of samples of bridge work executed fifteen months after the lad begun his apprenticeship.

Bridge work, I think, may be taken as a kind of dental engineering; here are some drawings and working plans of stresses and struts deducted from a book on construction worked out by the pupil as a guide to the principles underlying certain cases applied to the mouth. Naturally it takes time to fully prove the value of a new system of education, but it is worth noting that the first student trained under this technological system has since completed his two years' surgical course in the dental department of Guy's Hospital, by taking the prize for practical dentistry—another illustration of the axiom that a good mechanic makes a good operator.

In concluding this paper, I would like to say that this "Institute of Technology" has now been started in London, at 4 Langham Chambers, W., where we shall be very glad at any time to see members of this association and any reputable dentist. Its existence has come about from the simple fact that a certain number of dentists having come to the conclusion that they could not adequately train pupils in their own laboratory have combined to provide the necessary capital, and have started a school for the sole purpose of teaching mechanical dentistry.

An inspection of our workshops and laboratories would do more to convince you of the thoroughness and the objects of the scheme than this somewhat imperfect exposition of what we consider a systematic training in mechanical dentistry.

PROCEEDINGS OF SOCIETIES.

AMERICAN DENTAL SOCIETY OF EUROPE.

Proceedings on Monday afternoon, August 5, 1895.

Annual Address of the President, followed by paper on Tin and Gold by Dr. Spring. Discussion:

Dr. L. J. MITCHELL: After the experience I have had with tin and gold I can readily endorse all that Dr. Spring has said of a different combination of the same material. I have used pure tin turnings, mixed with Watt's crystal gold, thereby getting a material that is cohesive all the way through. Not being dependent entirely on the wedging system, you are enabled for contours to build out as rapidly as you could in any other way. I believe it

would be possible to have a combination of tin and gold made in a single foil, or in crystals which would give us the cohesive properties of gold, with the admixture of tin. I think it would be worth while to see if we cannot get some combination of the tin and gold worked out for us by the manufacturers.

Dr. MILLER: I would like to refer to a remark made at one of the New York Societies by Dr. Ottolengui on the question of tin and gold, which stands in contrast to the remark, so often made that an American is always so ready to put anything to practical use. Dr. Sachs, of Breslau, as well as Dr. Abbott, of Berlin, Dr. Jenkins, of Dresden, and many other eminent European practitioners have used tin and gold for twenty years. It has not been possible to introduce it into America; the great majority will not have anything to do with this tin and gold combination. I read sometime ago that Dr. Ottolengui had seen a filling which had been made by a very skillful operator, and that the filling was disintegrating and was very soft and powdery, so that it could be scraped out with an excavator, and that he did not find it a good thing to use. People found their remarks on single observations. I consider that it is absurd to come to any conclusion regarding the merits of any material by one single filling. I have a filling in my own mouth which has been there since 1876, which does not show a single trace of wear, put in by Dr. Abbott, of Berlin. There is not the slightest fear of its being able to resist the effects of mastication on the grinding surfaces, but it must be perfectly well condensed. When we have an excess of moisture, then of course the operation becomes more or less discolored. One place where it is not hard enough to stand the force of mastication, and where we must have a cap of gold is on molars and bicuspid. I have not been able to make a filling sufficiently perfect in such places. The only necessity which we have for undercuts therefore in fixing the caps of gold is that it may be retained until the union is obtained.

I find myself many uses for tin and gold, and find it so much easier to perform operations with it, and that has been the experience with many others to whom I have recommended the process in Germany. It is a rather complicated process, and I do not suppose we have time to go into the best way, but I think it is easy to use in comparison with hard gold, and I only hope that those who are present will give it a trial in grinding surfaces. I think that

with the same amount of effort, you will obtain a much better result with tin and gold than by gold alone.

There actually does occur a solution of the tin which is afterward redeposited. The tin is gradually dissolved, and you will find that the tin in connection with the gold will become gray, and the gold will be just as gray as the tin. We know that metals when they are deposited in a very fine condition do not often appear in their original colors, but appear in a very black state.

Dr. N. S. JENKINS: In regard to that which Professor Miller has mentioned, that tin and gold does not find ready reception in America, I think that some of the reasons are evident. The color, as it is often used, is objectionable, and moreover it has the appearance of being cheap sort of work in the minds of many men. People have often regarded it as the resource of incapable, men instead of understanding that it is only one of those many appliances which the thoroughly skillful man will judiciously make use of. It is possible to use this combination in a most injudicious manner.

I would like to call to Professor Miller's memory a circumstance which occurred a little while ago at a meeting where the members were principally Europeans. Professor Miller remarked upon the advantages which he had found in the use of tin and gold. in the presence of these gentlemen, and to their utter amazement he filled a tooth, which as they said, they had never seen done with such rapidity and with such good results.

I am sorry to say that the example failed, for it was not long before I began to have instances coming to my observation, where with the same rapidity apparently, tin and gold had been poked into the cavities with disastrous results. I believe that there can be no question as to the durability of this material. I have seen for instance, fillings which Dr. Abbott had made as temporary operations in soft teeth where it was impossible to get the cavity dry, and which he afterward intended to replace with gold. Thirty years afterward I have seen these fillings in a perfect state of preservation, and I think that that may be regarded as a sufficient test of the durability of this material. I do not of course wish to criticise, but want only to make one remark on a point in Dr. Spring's paper. I have found myself that it is a mistake to suppose that it is a very easy matter to make a perfect margin at the cervical wall. It is quite possible that under favorable circumstances a good degree of solidity is obtained. I think my experience is the most ex-

tensive in this material, and I think that the margins must be very sufficiently condensed, and if this is done it will not be a difficult matter to get a smooth and even surface. It is sometimes a matter of considerable difficulty to get an absolutely smooth surface. In my own practice I have a very large use for tin and gold, and I find that my tendency is to use it almost exclusively for the lining (not very deep) of cavities. I intend to make the body of the filling with only gold alone.

Dr. W. MITCHELL: I want specially to speak in regard to its durability and acceptability to the teeth of children. With the first and second permanent molars it is a question in our minds what to do, and I almost invariably use tin and gold as being infinitely better than amalgams or tin alone. It does not discolor the teeth and if the patient wants to have them filled later with gold we have not discoloration to contend with. In regard to the cervical margins, I have certainly for ten or twelve years been using a lot of tin and gold for the cervical margins of my fillings and in connection with the finishing up, I find that there is considerable difficulty. I use an instrument which will act as a shaver, and by that means you can get your margins very nice and refined. I am using as much or even more tin and gold than I have ever used. I have not used it in the way Dr. Spring suggested, but at the rate of one-third tin to two-thirds gold, but I believe that in the one-fifth proportion that has been spoken of, it will resist mastication just as Dr. Miller has said.

Dr. FAY: I think it was about twenty years ago that Dr. Jenkins brought this subject forward at one of our meetings at Hamburg. Since then I have tried it, and I saw only recently a child for whom I had made both gold, and tin and gold fillings. I found the former gone and the latter remaining perfectly intact and hard. I find it specially useful with German patients, who have those soft teeth, where tin and gold has resisted, while gold and amalgams and cements will last only a couple of years. I have one family in mind at present where I filled all the teeth of the children with tin and gold, and it is the only thing which has resisted.

Dr. DABOLL: I have seen some fillings the surfaces of which on investigation I thought were disintegrating and becoming granulated which I found to be the case on examination. I used tin and gold a great deal in several bicuspid and on molars, and five

years afterward I found these fillings in a perfect condition. I use it a great deal in children's teeth and I can do a filling for a child much quicker than with amalgam or gutta-percha, and in all these cases where I have filled six year molars, I have never found any failure. I use an excess of gold, two-thirds gold to one-third tin, on account of the color. I had one case of a young Australian for whom I have filled a posterior and approximate cavity on the second bicuspid and the patient went back to Australia. I filled about one-third of the cavity with tin and gold and the decay had extended through on the back of the part filled with gold and against the pulp wall of the posterior cavity around it but the part filled with tin and gold was perfect.

Dr. SPRING : In regard to the remarks of Dr. Jenkins I would say that I may have failed to make the statement clear in regard to approximate cavities. The matrix I believe in the use of, and after the filling is put in, and the matrix removed, one has a perfectly smooth surface, and there is no tin and gold overlapping the edges and that is why, with the softness of the material, it is in a very few moments polished. The cylinders are cut just the same length for this, but are filled in several layers so as to be sure that the cervical margin is thoroughly filled, as well as every other part.

Dr. DABOLL : What proportion of gold do you use ?

Dr. SPRING : Five parts of gold to one of tin. I get a much better color and the working is the same. The convenience of the tin and gold in the hands of a good operator is so very great. The morning before I left home when I was very busy with other things, a patient came in with a large cavity in a lower wisdom tooth in a place where it was very difficult to keep dry, and yet it was very desirable to make a water tight filling. I feel that the patient was better served by the tin and gold filling I put in, than by any other which I might have put in. I think those who have ever used it for such cases will find that they will never consent to give it up.

Dr. SPAULDING : I have noticed in tin and gold approximate fillings a tendency for the surface to become roughened by the electrolytic action which Professor Miller has spoken of, and especially where they have been capped over with gold. I have noticed several instances of this, not in fillings which I have done, but which have come to me, and that I take to be tin and gold fillings with a gold cap on top. It is very annoying to have this

roughness when you wish for perfect cleanliness, and an easy passing of the silk for this purpose.

Dr. SPRING: In those cases do you not think it is an imperfect condensation of the material?

Dr. SPAULDING: Yes, I think it may be so.

Dr. SPRING: Since using the matrix I never have the roughness spoken of by Dr. Spaulding come to my attention as I am able to more perfectly condense the surface, while before I was not so successful. I condense principally with the hand mallet.

Dr. DABOLL then read his paper, the Mission of the Matrix.

Dr. CUNNINGHAM: To my regret I have not heard the paper read, but merely its conclusion, and being a matrix filler I could imagine that I should have written very much the same thing myself. He has certainly brought the matter forward strongly, as far as gold fillings are concerned. I am loth to say that I am in favor of amalgams; in fact I think we can take in and appreciate all materials. Amalgam rarely gets the required amount of attention, but we should study well the material which we use, and I will undertake to say that I could show results of years where large extensive crowns have been built up with amalgam. Meanwhile I know that by the use of the matrix you can achieve all that, and the simplest kind is one that has no screws. The strongest and best worker is the man who likes to work under the simplest conditions. Fill a cervical cavity with a copper amalgam, and keep the matrix in position, leaving it there for twenty-four hours, and you will have a revelation in the use not only of what the matrix can do, but what amalgam can do. I am perfectly certain that for the bulk of people who cannot pay for contour work, there is an economical feature, and I should like, as strongly as I can, to advocate the use of the matrix. I should like to say that in my opinion the matrix is only second in importance to the rubber dam.

Dr. RATHBUN: Had I but three breaths left in which to speak, I should use two of them to compliment the last two speakers on the way in which they have pointed out the advantages of the matrix, but I should certainly not use my last remaining breath to suggest the use of copper amalgam in cervical cavities. It has been a long time getting through my head (but it is thoroughly there now) that any one who uses amalgam under the gum is either not over observant, or is not keeping a careful chart of his

own fillings. Every copper amalgam filling which I have put in, except in rare cases, has been unsuccessful

Dr. DABOLL: I have been using the matrix for at least twenty years, and have often asked the profession what they thought about it. Their reply in answer to my question: "What are you doing with the matrix?" has always been that it was not satisfactory. I had met Jack once, and I was anxious to know what was the experience of other men with the matrix, as it was giving me satisfaction as far as I was able to observe. And I wrote him a letter in which I asked him: "Are you still using the matrix which you devised some years ago?" "Have you derived from it the advantage which you expected?" "Have you found that you do better work with than without it?" "Can you give me any reason why the dental profession generally has not adopted it?"

He wrote me in reply saying that he found that it lightened his labors, and that the only reason he could give why the profession had not taken it into general use was because the dentists did not comprehend its application.

You cannot make a proper matrix with the ordinary German silver, because you must have that fourth wall of the cavity rigid and you cannot get the same effect with any other but Jack's matrix. He has stopped making the thick ones, and now makes them all one thickness of steel, bent to give a contour to the tooth. There are cases once in a while where no matrix which is made will answer the case, and you have to make one especially. You must have the trick of wedging and keeping them in position. It was curious to see how the man who had not tried it, found difficulty in using it. Jack said that the average dentist was not equal to the application of putting into position and keeping it there. Speaking of tin and gold, in his long paper, he discusses the matrix, and says that he could not make a good filling without it. If you take the matrix out of my practice, I think I should resort to plastic fillings for approximal cavities. You can fill against more delicate enamel with than without the matrix. One must have right-angled and beveled points, some thick, some thin, and there must be at least a dozen, in order that the varying sizes and angles may give facility.

In a clinic given before the Buffalo Association, I filled a tooth for Dr. Snow with the matrix, and after putting in the

filling which was on the posterior surface of the second superior molar, I removed a wisdom tooth and simply burnished the filling without finishing it. When I examined that filling this last winter, it was perfect.

Dr. FIELD: There remains nothing to be said, after the comprehensive paper by the writer, and its strong endorsement by Dr. Cunningham. I have used Jack's matrix since its first introduction, and just as both of these gentlemen have remarked, I could not do without it, but it depends upon the manipulation and the fixing of the matrix in the proper position.

Dr. DABOLL: A good many men think it no difficulty to put a plastic filling in an approximate cavity, but I assure you it can be done a great deal better with the matrix than without.

Dr. CUNNINGHAM: With what kind of gold do you begin, when you begin your cavities with gold?

Dr. DABOLL: Pack's cylinders.

This discussion was followed by the reading of Dr. Bryan's notes about ring matrices.

Dr. C.W. JENKINS: One point which Dr. Bryan has put forward here, is I think very important and that is, that it is very much easier and more practical in putting on the band to have it for the cervical margin. Dr. Bryan drew my attention to the use of this a few years ago, and I find them extremely useful and I use it for the margins, except in nonaccessible places, and then one can get more room and work better without it.

Dr. CUNNINGHAM: It seems to me that those ring matrices and mandril which have been exhibited here to-day, are specially designed for that purpose. In connection with the use of amalgam, the matrices ought to be of different breadths, and not as a series of rings of one dimension.

The best metal with which to make a matrix seems to be the Herbst metal. The German silver does very well, and at the suggestion of Mr. Brunton, who has been using the nickel for some time, seems to be very good; but the Herbst metal seems to work in my hands very well. The whole system works so well that it is now eight or nine years since we have had such an application. I have found a difficulty in getting men to take it up. For certainly over six or seven years this has been instructed or taught, but not made practical use of in the schools, and so it has been in societies.

I would only like to say that if you will adopt such a system as that, and will have two mandrils instead of one, I am convinced that you will find it a revelation of what the matrix will do.

Mr. DALL: I had a few of these matrices, and since have been making them of German silver and gold gilt. I use them because it is the only thing I can get. I find these matrices excellent, and when I want to put in a dressing or two and there is nothing to hold it in, I slip on one of these bands, which is not unsightly if the patient should open the mouth in public. I use them at the same time for making gold caps.

Dr. W. MITCHELL: I stand alone here in the fact that I do not use a matrix, except when I did so on one occasion, to hold in a dressing. A preceptor of mine, I remember, got one of the first sets of matrices which Dr. Jack ever sent out; one which to-day could be bought for about ten cents. He found just the same difficulty then that I have reasoned out in connection with it since, and that is that it shuts out the light from the cervical margin. I can understand using it in connection possibly with plastic fillings, but I cannot see where it is necessary in gold approximal work. I think we can fill better to the cervical margin without a matrix than with it. The best matrix that Dr. Daboll spoke about was the separator. I have refrained from using a matrix because I have not seen any that led me to believe that the ordinary way could be much improved upon.

Dr. DABOLL: When you put a polished steel matrix between two teeth for filling a distal cavity, you have a great deal more light in filling the tooth. You do not need to see the cervical wall at all, all that you need is to know that it is smooth. It is not necessary in filling a crown cavity in a molar to see every point in it, you instinctively know that when you condense the gold it must reach every corner.

Dr. W. MITCHELL: I do not at all agree with Dr. Daboll, that you can see better with the matrix there than you can without it.

Dr. RATHBUN: I frequently place my matrix in position in order to be able to prepare the cervical margin of my cavity with a bur more easily, and to prevent it slipping up and wounding the gum.

Dr. C. W. JENKINS: I would say that Dr. Bryan told me a few days ago that this new gold works beautifully with the matrix, and that it works down under the edges, and when you

come to finish down, you have a most beautiful margin. He says it works in more easily than any other gold.

Dr. FIELD: Our friend Mitchell speaks of the matrix, and yet says he has not used it; that is to say he is condemning it, but has only used it once many years ago. That access to the light certainly depends upon the choice of the matrix, and it may be so high as to exclude all light, and we certainly have the same use of the mirror as we have without it. We cannot fail with care, with the right and left instruments as suggested by Dr. Daboll, to get perfect contact.

Dr. W. MITCHELL: I cannot see the merit of it, because it creates just what we all try to get away from. We all find it as difficult as we want it, to get light enough. It is quite possible with a plastic filling to fill where you cannot see, but I do not think it is so with gold. Then the difficulty comes in, in filling into these angles, you have to carry your gold into the angles, and if you cannot see where you are filling, how can you be sure that you are doing thorough work.

Dr. FIELD: As a whole, with the proper condensation of soft gold at the margins those difficulties may be all overcome. No man can use a matrix the first time. I do not pretend to fill an approximate cavity of any size, either distal or mesial, without a matrix, not with tin and gold, or gold, or amalgam, or gutta-percha even, if I want to get the best result. I even use it for plastic fillings, though Dr. Miller hardly thinks it worth while. I can put the matrix in in ten seconds, and it would take me five minutes to trim up a filling. I do it to save time and I think it is being generally adopted by the very men who were opposing it years ago. Dr. Jack showed me some new instruments which he had devised for use with the matrix. These instruments were curved slightly to the left and right, and beveled back, and rather broad, and that is what he uses all the while in condensing the gold to the margin. You have to get that knack of not letting the point come against the gum. You must have the same thing with another curve, and another bevel for the mesial surfaces.

Dr. N. S. JENKINS: There is a New England proverb which is in a sense applicable to this discussion, "Do not measure another man's corn by your own bushel." If there is one thing necessary, it is to leave an individual to work out his result in his own way. There are men who produce more brilliant results with than

without the matrix, and there are others, who, taking the same case, will produce an equal result; it is a matter of practice, and the tendency of a man's mind, and there is no such thing as taking a certain standpoint, and saying that this and this only will produce such and such a result. We need to see what is best in each individual case.

I have often had occasion to smile at operations which I have seen done in the same day by two different operators, under the same roof. Under distinctly different methods the one has succeeded in making a splendid result, while the other man has obtained exactly the same by methods which the first man would have found absolutely impracticable.

DISCUSSION ON DR. CUNNINGHAM'S PAPER (SEE PAGE 106).

Dr. L. J. MITCHELL: I quite agree that the regular certificate, as Dr. Cunningham says, is often a farce. Another important point is the question of paid instructors. I believe that there are practically few in England who are paid for dental instruction. The time of course is given. As a rule things that are the best are those that are paid for, and there is no reason why dental teaching should not be paid for, as well as anything else. It cannot be that the profession is going back by entering into things of this kind. It is well and good if people can afford it, to teach for nothing. It is not every one who is a good, practical dentist, who is a good teacher. Not every one who is a good filler can instruct others to do the same. There are specialists in the art of teaching, as much as in every other art.

Anything which can be done toward training pupils in that way, will be to my mind decidedly better, and I hope that the dental portion of the curriculum is not lost sight of. The other collateral branches are serviceable to students.

Dr. ROYCE: I have seldom listened to a paper which I have enjoyed more than Dr. Cunningham's. I am pleased to find that there is some slight defect in the British dental education, and I hope that some of our men will take note of this, and that they will not be so absolutely discouraged as they have been for a few years past. The British education we have found has consisted in spending three years in the laboratory and the pupil comes to us with eight months' experience. The first thing he did was to spend one year in running errands; about the third year, he gets up to polishing plates, and by the eighth year he loses the crowns down

the sink ! I hope that some of the men on the other side will be a little encouraged, and that they may some day have education there as well as on this side.

Dr. KIRK DAVENPORT : I wish to make a few remarks regarding the more direct working of the school as I have seen it. I have been fortunate enough to be the guest of Dr. Cunningham, and have there seen the work of his students, and have also seen the "Institute of Technology in London." I have seen with pleasure, the work as performed by the boys, and the progress made, and I have felt rather envious, when comparing other courses, at the time when I graduated. I felt it so insufficient, especially in metal work.

In these cases, I have found that they have worked more in a technic line than in direct mechanical dentistry, and I believe that to be the best manner of educating and getting proper mechanical dentists. The hand must be educated first, and by starting in with wood or metal turnings, or carving, or work of this sort must be infinitely better than to have the idea of only trimming up a model or cleaning the laboratory.

If this method suggested by Dr. Cunningham could be carried out, I am sure that as far as England is concerned, there will be a great improvement, and I hope it will be copied in our schools, or in similar institutions at home, to improve the mechanical dentists of America.

Dr. W. MITCHELL : I must say that the paper appeals to me very strongly indeed. I like this subject of mechanical dentistry very much, and I know to a certain extent what Dr. Cunningham has passed through in trying to promote this condition of affairs. There is no question but that there is room and necessity for a thing of this kind in England. I have been very much impressed with the value of the institution which turns out mechanics in the various handicrafts, and that, in an exceedingly creditable manner. I found myself when I visited their exhibitions that the work was worthy of all credit to older hands and heads than theirs, and the work that has been passed around is deserving of very high praise. The man who has the best possible repertoire of collateral handicrafts will make the best operator. Show me the man who is an artistic workman, and I will show you an excellent operator.

The man who is able to sit down to the bench and shape and form out any piece of work or mould in position will make a better

surgeon and dentist for being able to do that. It does not fall to the lot of all of us in private practice to formulate such a curriculum as this, but we can all have a try at it. We all know the conditions under which we labor in accepting pupils. There is no danger of our giving students too much for their premium; if we give them all it is possible for us to give them, we give them probably but a reasonable return for their money. If you take a slipshod haphazard course with the boys, there will later on be no good result. I know about how the laboratory was when I began dentistry in 1867. I was fortunate enough to be able to get into a fairly good one and I saw the possibilities of the situation, but I have been about in America quite a good deal and there are places where they take and grind up gum sections, which they dignify by the name of "work room" or "laboratory." You will find 100 men who carry it on in the way I have mentioned, to one man who carries it on in the way it should be.

Where is the laboratory as a rule? It has usually the worst light in the establishment, though it ought to be light and airy, and comfortable. If we make things attractive, we shall have a better class of students and they will work to better ends than if thrust down in some dark and dismal cellar. And these people are expected to turn out nice work! It speaks more for themselves if they turn out good work, than it does for their preceptors. I believe in teaching my pupils mechanical principles. Of course we all have our own standards to work to, but I think that an institution of this kind is an excellent thing. This is the basis of our operating, and the salvation of teeth. We have to fill teeth and we have to do it by being good mechanics. Such an institution of this kind will assist students very materially in becoming so.

To supplement Dr. Cunningham's wonderfully good exhibit here, I will pass around a few instruments which were made by a pupil of mine from the sixth to the eighth week he was with me. They do not represent the real finished article, but the sixth to eighth week work of a student, which will show that I have been trying to work in a private way, while Dr. Cunningham has assumed the position of a public benefactor.

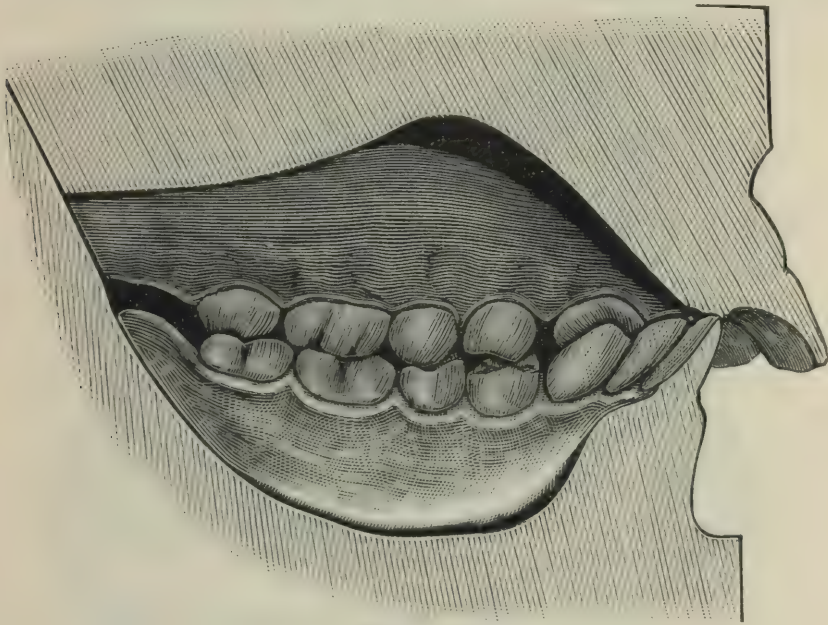
TUESDAY'S PROCEEDINGS, (MORNING).

This was a very extensive and interesting *exposé* of all kinds and systems of porcelain inlays.

Mr. Dall's, of Glasgow, lantern demonstration.

Dr. W. MITCHELL: Speaking in regard to this work demon-

strated by Mr. Dall, there is no question at all about his being right. I have only seen one that I would consider good of moulded and fused inlay. In my hands it is not a success. The best are undoubtedly those worked out by this method. The moulded inlays are probably best produced by some process akin to the Lyon furnace, but the best plan is the one adopted by Mr. Dall. The great advantage of the English teeth over others is that you can grind them and polish them. For fractures, simple or compound, the method shown is undoubtedly one of the best, also in small pitted teeth where we find quite a depression. Porcelain undoubtedly is the thing, especially in a lady's mouth. The best way we find is to approximate the inlay to the cavity ; by a mandril you make your



MODEL I.

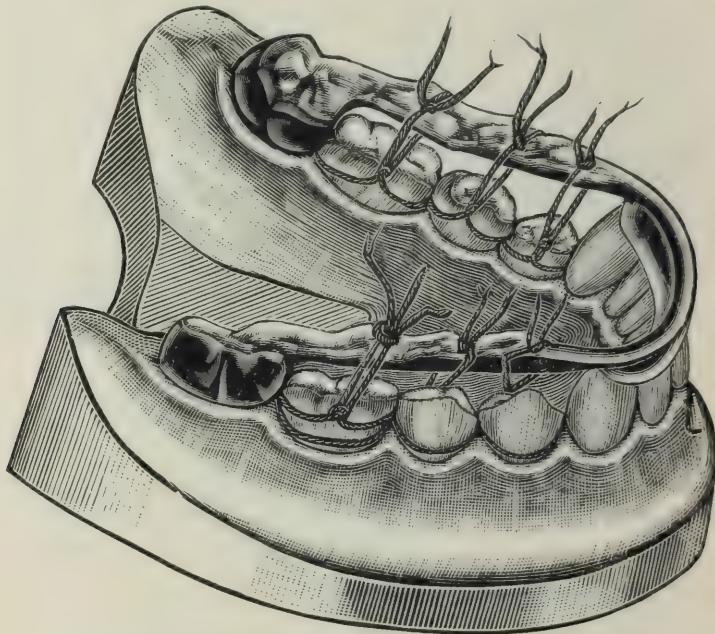
joint in the neatest possible manner and the inlay can be ground up and polished on the face as you would a filling. In regard to the covering of the roots, a method shown by Mr. Dall using porcelain for covering natural roots to resemble the gums, I think is an exceedingly ingenious device and one which does not receive a sufficient amount of care and attention.

I am thoroughly grateful to Mr. Dall for the pleasant way in which he has presented his cases to-day, because they mean hours and hours of the most conscientious labor in order to get them in this condition for our consideration.

Incidents of office practice. Case in practice, (anterior protrusion).

Model I. represents the mouth of a Spanish lady, seventeen years of age. The articulation of the bicuspid and molars is normal.

Dr. W. S. DAVENPORT: The lower arch is very much curved downward with the incisors biting into the gums above. The facial expression was very unpleasant, as the protruding teeth caused an upward roll of the lip. The patient was the only sufferer from this cause in her family, and she had none of the habits to which similar cases are attributed. The first means employed toward correcting the irregularity was to insert a bridge appliance, which was fastened by the use of gold caps to the two twelve year molars and brought forward a few lines above the molars and bicuspid, resting with a gold saddle on the six front teeth.



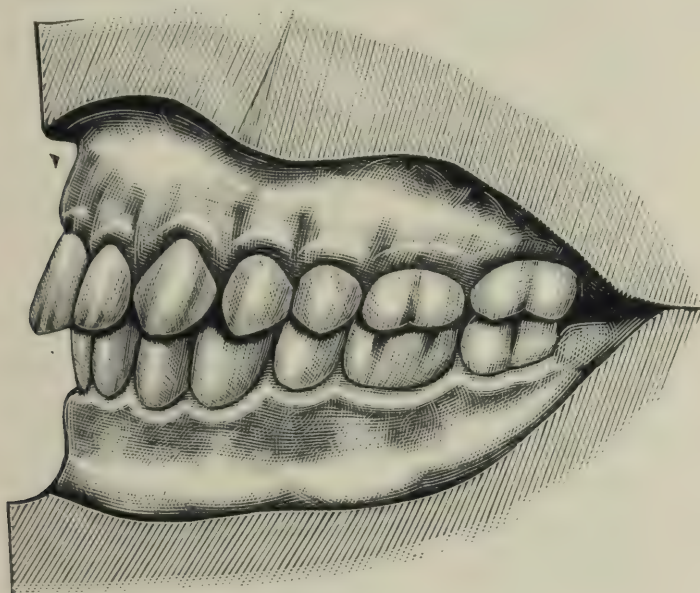
MODEL II.

In two weeks the arch was spread and the teeth were drawn up to a normal position by the use of ligatures which were looped around the bicuspid and molars and fastened at the lingual surface, then tied to the masticating surface of the bridge above. (See Model II. with bridge in place.)

The ligatures were removed in about one week, the teeth remained firmly in this position and the patient ate on the bridge for three months. I then removed the bridge, spread the upper arch and there was ample space to draw the protruding teeth to their position, which I did. (See Model III.) This was accomplished

by the force obtained of twisting wires as described in the *International Dental Journal*, April 1893.

Dr. ADAMS: What would you do in a case like this? About two months ago, a lady called to consult me about her child, whose mouth was very similar to this one. The child had had inflammation of the brain on two occasions, and the physician who had treated her, was opposed to having any prolonged operation performed on the teeth; anything that would tend to irritate the child or cause her too much inconvenience was to be avoided. I suggested enlarging the arch, but this was objected to, as causing her too much inconvenience.



MODEL III.

Dr. W. S. DAVENPORT: What was the age of the patient?

Dr. ADAMS: About thirteen or fourteen years of age.

Dr. DAVENPORT: Under those conditions, I should advise the patient not to have anything done.

Dr. ADAMS: The mother was very desirous of having something done, because the child is disfigured.

Dr. DAVENPORT: What was the cause of the irregularity?

Dr. ADAMS: That I do not know positively. The only trouble had been with the brain.

Dr. W. S. DAVENPORT: It is very difficult to say, in a case of that sort, what I should do without seeing the patient. But under the conditions I would suggest that the patient have an appliance adjusted to the upper arch in such a way, that in eating, it would drive the lower front teeth downward.

Dr. ADAMS: I had suggested that if they objected to having the arch widened, to make a rubber plate for the roof of the mouth, allowing the child to bite on that, to force the lower teeth down for six months or so, and then extracting two bicuspidis to give room to have the front teeth pulled back.

Dr. DAVENPORT: How was the bite in front?

Dr. ADAMS: The four centrals strike the gum above, and the upper bicuspidis were so far forward that they did not articulate well with the lower.

Dr. W. S. DAVENPORT: I have seen a good many failures (where their bicuspidis have been extracted, or the arch spread) on attempting to draw the front teeth backward, before proper space is secured, either by elongating a few back teeth, or shortening the lower front teeth.

Dr. ADAMS: How are you going to retain them? The natural tendency is for them to come forward again.

Dr. W. S. DAVENPORT: There is no natural tendency for the teeth to return to their former position, if we remove the cause and secure an interlocking retention.

Dr. ADAMS: I intend to get that by reducing the length of the lower front teeth; of course the pressure will be greater on the molars than on the bicuspidis. By forcing the lower teeth down, and shortening them, that will allow the back teeth to articulate.

Dr. L. J. MITCHELL: I think that this model of a case after correction is the best illustration we have of the corroboration of the patient's unwillingness to wear a plate. I have found it a difficult question to make the patient wear the retaining plate long enough. The lower teeth should go down. No matter if the retaining plate is worn for one or two years after, you will find that the teeth have gone out further than they were originally. It seems to me that the patient had failed to wear the retaining plate as he or she should have done; unless a strict watch is kept over them, that is what they are likely to do.

Dr. W. S. DAVENPORT: I see Dr. Mitchell does not understand that this model was made at the termination of the work. I was satisfied with the facial expression, and the articulation of the teeth was normal. Nine months after this case was finished there had been no change, and the retainer was worn only three months.

Dr. L. J. MITCHELL: The plaster between all these teeth represents just what you see there?

Dr. N. S. JENKINS: I had a case somewhat similar to this, because of the fact that I could only see the patient once in six months. The young fellow could not have suffered the slightest inconvenience, because he was undergoing an examination which could not be interfered with. I decided that the occlusion of the lower incisors was standing almost at right angles. I decided first to see if I could not get a little elongation for some of the molars and bicuspid, and I accomplished that by capping the two lower first molars. In the course of six months his second molars and bicuspid had elongated sufficiently, and I felt that this course of treatment would answer the purpose very well.

I made caps for the superior first and second molars, soldered on the caps two broad ears with a screw tap on the inside, and placed a platinum band over his superior incisors, ending in a strong screw which passed through the earlets on the buccal surfaces of the capped molars. On the posterior surfaces there was a nut on the side which could be every day tightened by the dentist, as the boy could not always come to me, and who sent me, fortunately, models of the mouth, so that in the course of three months these badly projecting teeth were brought back to their normal condition; and shortly afterward the boy came to me, and I had them retained in position by the capping which covered the incisors, and held them in this way, cementing them in place, for a few months.

In the meantime I kept the cappings on the lower molars, and I am glad to say that some eight months afterward the whole treatment was completed, and the molars have grown sufficiently so that it is now practicable to remove the cappings from the lower molars.

Dr. W. MITCHELL: I am very pleased to hear this remark of Dr. Jenkins; we had two cases at Geneva, and it occurred to me at the time that this would be the treatment in those cases. I am intensely pleased to find that you have had a case which was in my mind, and with which you have had a practical success, as I had already formulated the theoretical proposition in regard to the treatment.

Dr. RATHBUN: I have a case here which I brought over so as to get the opinion of the members. Since I have seen Dr. Davenport's models I know how I can elongate the bite. The girl has just turned fifteen, the lateral incisor is small, otherwise the jaw is normal.

The first and second bicuspid, and a molar on the left and right have been extracted. The patient does not remember what has been done. There is a tooth showing through the gum, which as far as I can make out, looks like a bicuspid. I have very little hesitation in saying that these are the twelve year molars, but it looks very much as if there had been more than one tooth taken out here.

Dr. Jenkins has pointed out combining the two by capping these molars. I can raise the bite and raise the bicuspids, but at the present I wish to say that the lower incisors are badly wearing the upper incisors, and the shortness of the lower third of the face is very marked indeed. The girl is very pretty, and I should be very grateful to the member here if they can show me any way where I can improve her looks.

Dr. N. S. JENKINS: In the case I speak of, the deformity had arisen from the unfortunate habit the boy had of sucking his lower lips. The teeth were unusually firm, with a very strong alveolar process about them. For the sake of improving the appearance slightly, I took a slight shaving from the edge of the inferior incisors, which in this case was perfectly justifiable. I have a very great respect for the power of the screw. If the patient cannot be constantly seen, or is in such a nervous condition that he cannot bear the inconvenience, a slight turning of the screw will do its work inevitably. Any elastic appliance in the mouth of a nervous person certainly causes a far greater degree of irritation than a short turn of the screw.

Dr. KIRK DAVENPORT: I would like to know if in the elongating of these teeth, it is really accomplished from the fact that the teeth had not drawn their normal length, or if it is lack of occlusion. I think I saw the case referred to by Dr. Jenkins, and I know that great benefit has been had by using gold caps on molars, but to my great surprise I have found in my cases that, instead of the teeth having grown, the molars on which I have put the caps had been simply driven into the gum.

Dr. DABOLL: I had a patient, a girl of seventeen, the quality of the enamel of whose teeth was so defective that it eroded as fast as the teeth erupted, leaving nothing but the stumps. The twelve year molars were level with the gum, the incisors and canines were all wasted to that degree that it was impossible to save them even with cement. I cut them off and crowned them, that is, the superior incisors and cuspids. Then the molars were so sensitive,

and they had wasted so close to the pulp that the girl could not eat on them, and was suffering from want of proper nutrition. The occlusion on these teeth showed that as they had wasted, the upper ones had elongated, and the lower ones had risen. I capped the upper and lower ones and the girl could not shut her mouth to within half an inch, but in ten days' time she could shut her mouth together, and in four months' time had gained fifteen pounds from the very fact that she could masticate her food.

Dr. ROYCE: I thought I had nothing to say, but this case brings up things which often come before us in England. French people are very fond of making fun of the English girl with her teeth protruding, and people think that it is simply a matter of climate, which it may possibly be, for the English climate gives a relaxed throat which causes mouth breathing.

We should in the first place see whether the patient breathes through the mouth. I had a friend who sent his little daughter to me, and wanted me to regulate her teeth. I saw that her tonsils were so large that there was no space left. I refused to take the case until she had had the tonsils removed, but the father declined to hear of this, and finally the throat became so bad that the surgeon whom they consulted said she must have the tonsils out.

In two or three years' time she came back to me, and this defect had three-quarters remedied itself. The same general principle I found in another case; I immediately said: "It is no use my trying to do anything until the surgeon has done his work; for some reason the child does not breathe through her nose." The mother began to think that I must be a prophet; she said "That has been attempted, but the child's heart is in such a condition that she cannot take an anæsthetic, and they cannot operate properly." I said: "When I have regulated these teeth, the cause will still be there, and they will go back into their own places and will be as bad a few months after I have finished, as they are now. It would be useless." We ought always to have a thorough inspection of the case by a specialist in that particular branch.

Dr. FAY: These cases are most prevalent in Belgium, owing to the dampness of the country. As for these lengthened front teeth, I have sometimes made a simple vulcanite frame, which allows the back teeth to lengthen themselves, and have found great benefit that way.

Dr. FIELD : I have some good hints in regard to the method of accomplishing this, but I want to get some good hints myself also. I fail to get parents to allow their children to submit to the necessary treatment. They ask : "Cannot they take the plate out when they are in company, going out to parties, etc." I find that I have not the power of persuasion, and that the parents always object.

Dr. W. S. DAVENPORT : In such cases, I cement my appliances to the teeth.

Dr. W. MITCHELL : I have exactly the same difficulty as Dr. Field, but as I have a definite understanding it does not make a particle of difference whether they carry out the treatment or not ; they are going to pay for it all the same, and my experience is that the parents will look after the rest.

Dr. FIELD : I have a case in my mind now ; one of the first questions a lady of very high position asked me was whether the child would have any comfort and freedom, and when I told her that there must be a constant wearing of the plate, she refused to have it done, though perfectly able and willing to pay the cost.

Dr. SPAULDING : Latterly I have been using Dr. Angle's appliances, and in his system of regulating, he does away entirely with plates, and almost entirely with any unsightly apparatus of any kind. A few bands around the teeth, and some gold perhaps showing in some difficult cases, but his method is exceeding simple and practicable. I was in hopes that Dr. Angle would be here himself at our meeting, and explain to us his method, and, with the aid of the lantern, show us some cases in practice. He has devoted himself entirely to that work out in the northwest, and has been very successful, and I think his system, as far as I have been able to look into it, is certainly superior to any of the others I have ever examined or used.

The appliances are all easily purchased, and brought within the reach of everyone, whether they have means for manufacturing or not ; it is not necessary to manufacture one's own apparatus ; the rings and bands and everything belonging to it can be purchased, making it very simple and easy.

I speak of it in this connection because Dr. Field mentioned the unsightly plate which we have all of us been using so long, and I think this is one means of overcoming that difficulty where it is

desirable. I have some of his things with me, and shall be glad to show them to any who may be interested.

Dr. FIELD: I have used some of his appliances very successfully, and satisfactorily. I do indeed think that his method is very practical.

Dr. DABOLL: Have any of the gentlemen observed that after the expansion of the upper arch that the difficulty in the breathing was very much modified?

I have had several cases where the mouth breathing was habitual, simply because the nasal passages were so restricted, and after the expansion of the upper arch the breathing was very much relieved.

Dr. FIELD: I have a case on hand now where there has been a modification by expansion.

Dr. THOMAS: I have had two cases where I have had great success in making a capping of the molars, gold crowns, with an inclined plane to make the articulation of the different teeth more thorough, it changes the articulation very much when necessary to do so.

Dr. W. MITCHELL: *Mr. President:* As this session is devoted to the relating of incidents of office practice, I take the liberty of changing the subject.

I have two cases about which I want to speak and to ask whether any one else has had experience in the same line. Where it was necessary to destroy the pulp of the first left superior molar, I did so with arsenic, and a week after, the patient came to have the tooth filled. Not being in a fit condition, I sent him away again for another week; and on his return I was able to get into the canals very nicely, but there was some sensibility remaining. I was cleaning out the nerve canals in the usual way, and I noticed that every time I approached a particular part the patient would cough. I was not sure whether he had an irritation of the throat, and asked him; but he knew of none. In the buccal canals was where the slight sensation was, the touching of which produced the coughing. There was no question at all about my ability to produce this coughing, and the patient was so interested that he got me to do it a number of times. I do not know whether any of you have noticed the same conditions of reflex action in such cases or not.

The second case is that where a lady had had the first left superior cuspid extracted. She came and asked me what I could

do, and I asked her why the tooth had been extracted. I said to her: "If you can go and get that tooth, we will see what can be done with it." She looked upon it as a joke, but I told her I was in earnest. She went back to the man who had extracted the tooth, got it and brought it to me. I saw that it had a very good root, but the crown was badly broken down. I selected a suitable Bonwill crown, and prepared the root to what had been the gum margin. I fixed the crown in position, and two days afterward I reinserted that root, and made a little splint to hold it in place. About that time I left for America, leaving the patient in my brother's charge. He had charge of the case for about a week or so, and it is now as firm and as good a tooth as any she has in her mouth.

VISITOR: I had a similar case, where I was treating a case in the lower jaw, when the patient went abroad and had the tooth extracted, and brought it back to me. I capped the end of the roots first, and it has been in position quite successfully ever since.

Dr. N. S. JENKINS: I think it is well to report our failures and misfortunes as well as our successes. A short time ago an old patient of mine, a young married lady who has been a great sufferer for many years, came to me, complaining of pain in the left superior molar; three years before, she had had a severe attack of neuralgia, for which there was no apprehensible cause in the condition of the teeth, and which was finally cured after a long and tedious treatment. As I was saying, she complained of pain in the left superior second molar, and I found upon examining a broken down filling that there was apparent, an extremely microscopic exposure of one of the horns of the pulp.

It did not seem to me to be prudent to attempt capping that exposure, and I decided to kill the tooth in the usual way with arsenic, but I am sorry to say that after I had devitalized the pulp, and had removed the pulp from all the canals to the foramen, I was convinced that there was no cause of irritation from the tooth and the pain continued.

She was a most devoted and amenable patient, willing to do and suffer whatever I told her, and her confidence became so touching, that I was very much distressed at being forced to tell her that I could not do anything more for her, and that we must consent to that now, very rare thing and sacrifice the tooth. I had determined previously that there must be some lesion at the buccal roots of this tooth. I saw upon extraction, that there had been

absorption at the buccal roots, which gave to this very sensitive patient this acute and long-continued pain, and considering her depressed state of health, the question of relieving those sharp points and replanting the tooth I discarded as not advisable.

Another case I have to report : There came to me five years ago, a lady who is an eminent operatic artist, with the right superior first bicuspid in a sadly mutilated condition. She had fallen into the hands of the Philistines, and was in a very pitiable condition. The canals were blocked up, and a terrific abscess had at last driven her to seek my advice. The treatment of the tooth was unusually prolonged, but finally it was in a thoroughly antiseptic condition, and for five years gave her no discomfort.

She came to me after there had been some very changeable weather, and in the exercise of her profession she had contracted a very violent cold. Now these roots had been very carefully filled with oxychloride of zinc, and the tooth was very tender, so I did not feel like getting an opening in order to treat the abscess through the root, and I could not at all think of her losing the tooth which was of very great importance to her. I finally decided to drill a hole diagonally through the side of the alveolar process directly above the abscess through which I treated and cured this very annoying disease.

Dr. SPAULDING : About seven or eight years ago I was treating two lower bicuspid teeth in bad condition of abscess. There had never been any swelling of the jaw, but the canals were large, the opening was good with plenty of chance to get to the bottom, and I put in my dressings, I think, for five or six weeks, from time to time every few days, and the more I dressed these teeth the more pus there was. Every time I took out the cotton dressing the pus would just boil right out, like water out of a spring. As long as these broken down teeth were filled with my dressing, and sealed with gutta-percha, they gave no inconvenience. I did not like to say that the teeth must come out, so I decided to fill them, leaving a mesh of cotton in the canals, saturated with carbolic acid. I filled the teeth and the lady went away.

I had an opportunity of seeing those teeth last year. I took out my cotton mesh, that I had left there some six or seven years ago, and I did not find a particle of pus, and no perceptible odor. I filled the canals last year in the ordinary manner with gutta-percha. That is a case where nature had brought about a cure.

Dr. W. MITCHELL: It has always been an open question whether pus has been absorbed or not. There must have been some absorption after the teeth were filled, otherwise what became of the pus?

Dr. DAVENPORT: Was this pus after the treatment followed by fresh blood?

Dr. SPAULDING: I do not remember, but I do not think so. I do not remember all this now.

Dr. W. S. DAVENPORT: In treating cases of this sort it is my practice to fill the root canals at once should the discharge of pus be followed by a few drops of fresh blood.

Dr. SPAULDING: I know that the pus was very liquid, and there was plenty of it.

Dr. THOMAS: I have had cases like that, and when they come to me I simply leave them open, and do not put in any cotton at all. When the patient comes back a week or two later, it is all right. I can treat the tooth with safety.

Dr. DABOLL: A gentleman presented himself to me under the advice of his physician. The center of the chin had a pustule as large as the end of my little finger. This would appear and disappear. At times it would swell and discharge, then disappear for a week or ten days. One physician treated him for tumor, another thought that it was a cancerous growth. The patient told me that in a year he had been treated by four different physicians, until finally the last one told him he must consult a surgeon, and that he thought it would be necessary to have a section of the bone taken out. The surgeon happened to be my family physician, and he told him to consult me. A casual examination showed nothing wrong. All the lower incisors and cuspids were sound, but I happened to have had a little experience with abscesses of the lower incisors, which had broken out on the outside, and the moment I saw this swelling on his chin, I knew that it was caused by his teeth.

I took a mirror and immediately discovered that the right second incisor was blue, just a shade of blue, enough to show the difference between that and the others. I had previously tried to treat lower incisors through the root canals, and found it a very difficult thing to do on account of the smallness of these canals.

I told the patient it was nothing but an alveolar abscess. I told him I would extract the tooth, remove the dead pulp, fill it,

and put it back. He said he must go back and consult the surgeon. In half an hour he came back, I extracted the tooth and found it just as I supposed. I filled the roots after disinfecting it with a weak solution of carbolic acid. He nearly fainted away when I replaced the tooth, but he went away and in two days he came back to me with the tooth all right. In ten days he could not tell which tooth it was, and the "tumor" and the "cancer" and the abscess had all disappeared. The small fee of a ten dollar note which I charged him surprised him as much as all the rest of the affair.

Prof. MILLER: Referring to the case of Dr. Spaulding, I think most of us have seen cases very similar to that where a fistula is present when you have treated the tooth suppuration goes on, because in all cases of fistula and abscess of the teeth we have more or less inflammation of the marrow of the bone; that can be readily seen from the intimate relation which the tooth has to the bone. We may heal the condition of the tooth itself, but we have still the necrosis of the bone and I have seen the suppuration go on for weeks, even after I have filled the roots, but this never causes me any anxiety, because that suppuration will cease in the course of time. These photographs will show perhaps the intimate relation of the root to the bone and the jaw. In the cases in question, I think you brought the teeth into an antiseptic condition, and nature did the rest. It might have been a coincidence.

Dr. SPAULDING: There were three teeth all in the same condition.

Dr. MILLER: We have always to strive to remove the cause, and I think we can assist nature by absolutely drying the root, and exerting a certain amount of pressure on the outside. Then we can risk filling the tooth when we otherwise would not have done it.

Dr. W. MITCHELL: My experience in connection with the very same kind of cases is quite different to that of Professor Miller. I do not remember a case where I have this continued flow primarily of pus and ultimately blood, where it is almost impossible to get it dry, in connection with the internal fistula.

Dr. SPAULDING: Not only was there no fistula in this case, but there had been no swelling of the jaw.

Prof. MILLER: I simply say that in both cases we have necrosis of the bone, whether we have a blind abscess or a fistula.

Dr. SPRING : A young lady came to me with a fistulous opening which had lasted for over a year. She had been treated by different dentists in traveling on the continent in large cities and had been obliged to leave before being quite cured, that is to say, by treating through the tooth, the fistulous opening had been partially cured. When she came to me, about six months had passed since she had had the last treatment. The mother had had a similar case, which had lasted so long that several teeth had to be taken out, and they feared the same result in the daughter's case. I took out the root dressing and found that it was in beautiful condition. I treated both the root and the fistulous opening by putting a bit of cotton saturated with carbolic acid and oil of cinnamon, and later, a little iodoform with it. I treated it for three months, and every time I took out the dressing, there continued to be a little flow of pus; each second day I put in a fresh dressing, and up to the day I stopped treating it there was always a flow of pus, but suddenly this stopped, and then in two or three days the opening closed.

Dr. RATHBUN : I have a case like Dr. Spaulding's; the patient wanted a crown put on a tooth, and wished to go away on the next Saturday. I cleaned the tooth out and found pus. My assistant is treating it while I am away. When I return I shall clear that root thoroughly, take a large sharp bur, and go right down to the end of that root, and I expect to find everything all right.

Dr. KIRK DAVENPORT : Of such cases as mentioned by Dr. Spring, I have had two in Dresden, which I remember particularly. Two superior molars which abscessed from bad roots. At the second sitting I filled the canals, although the pus was discharging a very great deal, but as Professor Miller said, I thought by depending on nature she would do the balance. After a month, the pus was continuing as badly as ever, and I injected cocaine, and used the bur in this case, and cut away some slight necrosed bone which was there, and in two weeks' time, all was quite healed. I think often we *over-treat* instead of *under-treat*.

Dr. SPAULDING : Dr. Jenkins remarked that it is sometimes well to speak of our failures, as well as our successes. A case which has interested as well as annoyed me not a little is that of a lady for whom I had made about nine years ago, some very fine gold fillings nearly all the front teeth being filled on their approxi-

mate surfaces and some few labial fillings. I saw my client at least every year and usually once in six months. Up to last year I found my fillings in excellent condition and giving promise of long usefulness. Last year to my utter confusion I found nearly every one of the teeth so carefully filled, melting away from my fillings and decalcification of the enamel all along the margin of the gums.

I could only attribute this to a change in the secretions of the mouth and yet I could discover but a *very slight* acid reaction to the litmus test. The lady had been spending several months at Wiesbaden but had all the while been in excellent health. She was not aware of any systemic disturbances which could explain this unfortunate condition.

Dr. MONK: Dr. Jenkins' question as to whether people went to Wiesbaden from choice or necessity, has anticipated anything that I might have had to say in the matter. The waters of Wiesbaden have no effect on the teeth.

Dr. W. MITCHELL: Was Dr. Spaulding's patient given to eating many sweets? I had a case in my experience in America of a farmer's daughter whose teeth had been under my care for a long time. The patient was I think secretary or treasurer of a candy manufactory, and there was nothing that would prove satisfactory in saving the teeth. There was the same slight acid reaction in her mouth, and I think there could be no doubt as to the cause. I understand that she is since wearing a full set of upper and lower teeth. It is quite a case of decalcification.

Dr. SPAULDING: The lady of whom I spoke has beautifully perfect enamel and up to last year there was no promise or indication of this sort of condition.

Dr. MONK: I should like to ask Dr. Mitchell if there was something in the atmosphere of the place, or if the cause arose from the number of the sweets she consumed?

Dr. MITCHELL: It must have been both.

VISITOR: I had a case not long ago of a gentleman of thirty-eight years of age, where I was surprised to find all the teeth completely cut round; every point of the molars had a cavity. He told me he was a brandy taster, and he said that his partner had lost all his teeth at about forty years of age, and had done nothing but brandy tasting for the last twenty years.

Dr. N. S. JENKINS: It is my experience and observation that erosion generally appears in teeth of good structure. So-called

"soft teeth" are apparently less liable to erosion than teeth of a harder structure.

Prof. MILLER: Yes, Doctor, but this is not a case of erosion, but simple decay. Did you test the gums at all times of the day, Dr. Spaulding?

Dr. SPAULDING: I gave her litmus paper to use, before taking her coffee in the morning and before eating two or three times a day, but I perhaps did not go into this quite as extensively as I might have done. This lady was very careful about her teeth. I wish to speak in this connection of another case which is exactly the reverse of the one just cited.

In my early years of practice in America, I was consulted by a young lady about twenty-five years of age with reference to the extraction of a molar which had given some warning cries but which I suggested could easily be saved. She then told me that she had long ago given up the idea of saving any of the teeth and expected she would have to lose them all. I expressed surprise and examined them all most carefully. I found all the anterior teeth, inferior and superior, badly decayed at the gingival margin, the decay presenting a black appearance and almost flint like density. She asked me what I thought. I replied that I could save them for her and she seemed delighted, but told me then that several years previous she had consulted Dr. B., of M., and that he had told her it would not pay to try to save her teeth, but that she would no doubt very soon have to lose them and have artificial substitutes. He told her the quality was bad and the oral conditions did not give promise that any operations, however skillfully performed, would be of long duration. I was astounded. I knew personally the dentist of whom she spoke and knew him to be one of the best and most conscientious operators in the West. I was young and just beginning. I examined again but could see no reason to change my opinion. I accordingly filled all those teeth carefully with gold and was rewarded with a good fee from a most grateful patient. I saw or heard from her for years afterward and she was still singing my praises. Here was a case of undoubted change for the better in the oral conditions so great as to transform the soft decay into almost flint like masses and almost wholly arresting its progress.

Dr. C.W. JENKINS: Dr. Spaulding's experience is no different to that which we observe in Europe, with regard to patients who have been in the hands of our best operators at home. After coming

abroad, all at once their good work seems to show signs of failing by the change in their habits of life, or something that has started it up. While they are on their travels, they seem to have new experiences of decay. I think we have all more or less noticed this.

Dr. DAVENPORT: I have had a great many patients in this condition and have come to the conclusion that it is because people traveling rarely take proper care of their teeth.

Dr. ROYCE: Do you not think however that a change of climate really does affect the teeth indirectly? The saliva has very much more to do with the decay of teeth than we have been used to believe. A change in the saliva may very soon cause decay, and a change of climate may cause a difference in the condition of the patient. We notice that negroes have most excellent teeth, but as soon as they change their climate their teeth are no better than those of the white people.

Dr. FAY: I have had patients, especially young girls, English, Belgians, who up to a certain period have had very sound teeth; and who have gone to school in Germany, and come back with their teeth all ruined. Then again I have had just the reverse, where having come to Belgium there has been a very favorable change.

Dr. DABOLL: Do you really think that change of climate will affect the teeth? I have not seen it in my observations where the teeth are well taken care of. Indirectly the teeth may suffer, but I have never seen any evidence yet to lead me to believe that change of climate affects the teeth.

Dr. N. S. JENKINS: The influence of change of location is marked not only upon the teeth but on the different organs of the body. A friend of mine who lives habitually in Paris, came to me last year, and stayed rather longer than usual in Dresden, where the cooking, I am sorry to say, was not very good. One day he came to see me, complaining of very bad pains in his teeth, for which I could find no reasonable cause. He was in a very bad state of health, and had to have his stomach washed out by his attendant physician, who after a time told him that he could do nothing for him.

I said to him: "There is nothing the matter with you except that you have for too long a time absented yourself from the excellent cooking to which you were accustomed in Paris." I ad-

vised him to return, and in about a month's time I received a letter telling me that he was perfectly cured.

Dr. MONK: In regard to Dr. Fay's remark about coming from Germany into Belgium, I firmly believe that the German cooking is responsible for a great deal of the trouble, not so much in the mechanical action, but more in an indirect way, in the want of nutrition. Where young English girls have been in Germany they have suffered from this want, but going home for perhaps a couple of months, and having the proper food, they have been all right. I am firmly convinced that the ordinary boarding school in Germany is the cause of much constitutional trouble.

Dr. W. MITCHELL: It is extremely difficult to say whether climate has or has not a direct effect upon teeth, but there are two cases which I have in my mind now which lead me to believe that it must have some considerable influence upon the condition of the mouth. I have as patients two brothers from Australia, and any one who has had any Australian cases will bear me out in my opinion that Australians have the worst kind of teeth.

These two boys have been well nourished, well developed, and brought up under all the good surroundings which this world affords. There are exceedingly good dentists in Australia, and they have been able to avail themselves of the best of treatment, but when I first saw them their teeth had been filled so much and still the breaking down process went on. The elder of the two boys I have not seen it necessary to put any fillings in for during the last two years; my brother I think saw one of them about Christmas, and whether it is owing to the climate, or whether their food has been better, or what reasons there can be I do not know, but certainly in the last two years I have only found it necessary to put in one or two fillings, and the younger one I think is going on in about the same way.

TUESDAY'S PROCEEDINGS (AFTERNOON).

Letter read from Dr. Thomas W. Evans.

Paper on "Improved Methods in Bridgework," by Dr. J. P. Carmichael.

Dr. ROYCE: I am sure, Mr. President, that all will agree with me in saying how greatly we are obliged to Mr. Dall for what he has brought before us, and I think I shall be expressing the opinion of all present in suggesting that we enter our most hearty

thanks for the exhibition of inlays, and his lantern demonstration, which has been prepared with such great care and ability, and which he has come so great a distance to present. We would like to compliment him upon the results he has attained, and we trust that the care he has shown may stimulate us all to greater efforts and more care, not only in inlay work, but in all our operations.

Dr. CUNNINGHAM: I should like very much to second that proposition, because I have had considerable experience in that kind of work, and I should like especially to say that Mr. Dall is certainly far ahead of any practitioner in this line of operation. I think his demonstration is of the very greatest importance.

Dr. L. J. MITCHELL: I should like to couple with the name of Mr. Dall, that of Dr. Birch.

PRESIDENT: We certainly feel grateful to these gentlemen for their outlay of time and patience in making us fully acquainted with their methods.

(The motion was unanimously carried.)

Dr. FIELD: I do not feel myself qualified to discuss crown and bar and bridge work, but I should like to get the idea of this society in regard to it. I am myself not generally in favor of it as usually carried on. I think it is one of the new methods of restoring masticating power, but one which is very much abused, but I should like to hear the expression of the society on the subject. I find very few cases where the conditions are favorable, and then in regard to the after-results, and the after-conditions, I find it almost impossible to get the patient up to that standard of care of the bridge work that is necessary—in fact essential to its success.

Dr. C. W. JENKINS: It becomes me to say little on the subject, because I have had little experience, but I am certain that it is extremely necessary to choose the right cases. Nothing can be more fatal than to put a piece of bridge work on an insecure place, as I know by my own experience. We should always consider the strength of the bite and the occlusion. This is one of the most important things in plate work, and the importance of it is still greater in bridge work, which is so difficult to repair. We see pieces coming to us to be repaired where the porcelain has been broken off, which are very difficult to restore satisfactorily, and where the patient is very much annoyed by the exposure in case they cannot come at once, because of the unsightliness. I think that those who have seen the work of our best operators cannot doubt that there is

a place for bridge work, and that it is serving a purpose that no other work can.

We cannot lay too great stress upon making the spaces as far as possible, self-cleansing. Where anything does get under and stay under a piece of bridge work, though there may not be decay of the teeth, it certainly makes a very disagreeable state of things for the patient or any one who comes near the patient.

I wish I had a model here of one case, which I found to be very satisfactory. About three years ago, I made a case for a gentleman, who had remaining only the cuspids and the second molar teeth and one central not very good, but worth using as an anchorage. I spaced the incisors between the banded cuspids, upon which I put Richmond crowns and attached the other teeth to them. The molars were covered with a cap, and over this came the cap which was to attach to the other parts of the fixture, my purpose being to construct it in three pieces, because of the difficulty of inserting it. It is always a troublesome piece of work to put in a complete denture of bridge work in one piece. The molars and bicuspid were attached to a bar, which was cemented into a shell bicuspid attached to the cuspid. It would have been better if I made the hollow dummies of platinum and filled with amalgam, as the cement has to be renewed now and then; but it makes a very firm and complete denture as it is, and is a great satisfaction to the patient.

Dr. CAMPBELL: I am perhaps one of the earliest students of bridge and crown work, and the first I made were all cemented ones. It only took me about three years to find out that this was the kind of work I would do for my enemies, and that I would reserve the other for my friends.

I had a patient who was going to New York, and when he told Richmond that I was making his work movable, his reply was: "When you go back to Paris, tell him to let that movable work alone, for it will surely disgrace him." I said: "That is all right, I am going to give up cemented work and do movable work."

Dr. WM. MITCHELL: Having had a little experience, I have come to the conclusion that there is no question at all that in selected cases, bridge work is decidedly the thing, but there are so many cases where it has been used where it is not adaptable, that has brought this kind of work into disrepute. There are lots of cheap institutions in London where they put in this work ad lib.

and the results are anything but gratifying to the patient or their friends, and I think it is because there is an absence of judgment in the selection of cases to where it is adaptable or where it is not. The question is to differentiate where it is better to use a plate or to do bridge work.

I think that I can quite endorse Dr. Campbell's ideas in regard to the cemented work. The cement itself becomes a source of trouble because there is not that careful consideration of fit; the cement is supposed to take the place of fitting. It becomes a nucleus for the secretions which vitiates the gums and produces a diseased condition.

I have seen during the last year a number of cases without good supports. We must have the fundamental principles of mechanics well understood (just as in the building of a suspension bridge, they would get their supports right), and I think these facts are too often lost sight of, and the result is failure.

That piece shown by Dr. Spaulding is an evidence of the way in which the work should and can be done, and both as far as appearance and use are concerned, they can be done just as nicely in the mouth as out of it, only it takes a lot of time.

Dr. SPAULDING: I have had some little experience with this sort of work, and I feel as Dr. Campbell and Dr. Mitchell do, that any operator should be exceedingly conservative in his judgment in regard to the selection of cases. It is certain that in the great majority of cases it is done too carelessly and without regard to the proper preparation of the ends, i. e. the supports, of the bridge.

Another objection is the extreme difficulty of repairing in the mouth, and it is fatal to a piece of bridge work to take it out of the mouth for repairs.

Not being able to be present myself at the last meeting, I had presented a little piece of my own, which by the use of the ordinary tube teeth, obviates this difficulty entirely. The ease with which it can be repaired in the mouth is apparent. It obviates the unsightliness of a large mass of gold, and as a consequence reduces the actual expense of the bridge. The amount of gold used is very minimum. I think that it is a class of work which is exceedingly satisfactory when it is carefully and properly done. That is my experience with it. I have some pieces which have given me and my patients a great deal of satisfaction.

I made a case in this same manner two years ago, and the lady

came to me the other day with a tooth broken off. They do not break readily, but they will do so now and again. It was a matter of about forty minutes to put on another tooth, and it was as solid and as good as when first put in the mouth. You will notice that the pin of the first molar is a modification which is not often seen; it is on a swivel, so that it permits of the adjusting of the bridge easily, although the direction of the canals are not the same, and when in place, fixed with cement, it is perfectly rigid.

Prof. MILLER: I would like to hear some one's opinion as to the advisability of fitting teeth in the way Dr. Carmichael has suggested, and which Dr. Mitchell has very much praised. I think it is a very risky thing to do. I do not do any bridge work myself, but my colleague does a great deal.

Dr. W. MITCHELL: Dr. Miller has evidently misunderstood me. I was simply speaking of the mechanical portion of the work. I personally would not want a bicuspid grooved through that way, as we have a great amount of trouble with bicuspids, and I do not approve of that part of it; I was speaking of the inlay part of it.

Dr. CUNNINGHAM: In trying to discuss this subject to some useful purpose, we should endeavor to focus the discussion. I do not say that my remarks are going to be valuable, but I think that that is the proper way to treat the matter.

I am struck with certain points; firstly, with the mechanical ability with which this appliance is made, more especially as I have had experience of some of the difficulties such a case involves. Secondly, you may remember there is an excellent paper published in the *International Dental Journal*, where the so-called fenestrated cap with a complete ferrule band at the cervical margin is described. Now in Dr. Carmichael's case there is no band coming forward here in front, yet you have all the principles here without that band coming over the labial surface. Nextly, as far as the lateral incisor is concerned, the æsthetic factor is the one that predominates.

I sympathize with the action, and the way he has cut that canine, but I do not sympathize with the way he has involved that second bicuspid. This is a three-fourths crown and from experience I have learned to avoid these things as far as possible.

I do not look upon my work as permanent, for a lifetime, but

ask myself: "Will it last long enough for it to be worth while the patient's undergoing it?"

I will undertake to say as a dentist and as a patient, that in my judgment I would sooner make or have that single tooth fitted with a fenestrated cap and carrying a lateral bicuspid there, simply for the sake of appearance.

When you come to a bridge, gentlemen, is it not a mistake that we often make, viz., adding porcelain facings when the case would be stronger without them. I should like if I might, later on, from the point of view of function, to point out some of the features shown in the models which I had the pleasure of presenting yesterday.

Prof. MILLER; If you put a piece in like that only for appearance, and not for mastication how are you going to prevent the patient from masticating on it? It must be strong enough to bite on!

Dr. CUNNINGHAM: I was only pointing out that you may have a case where the factor that predominates in bridge work is appearance, while in another or it may be in the same bridge the function of mastication is the dominant factor. I am not an advocate for large and extensive bridge work. I am trying to advocate bridge work from the point of view of small partial cases and when I suggested the plan that I have done, I was only pointing out the main features that would control the means to be adopted.

I would like to say that on one point I differ from Dr. Carmichael essentially. I do not believe that he has any sound grounds for stating that a live tooth capped is going to die, except on the basis that we are all going to die sooner or later.

Dr. RATHBUN: From what point of view do you avoid using three-fourths caps?

Dr. CUNNINGHAM: I have put on three-fourths caps, and I have been obliged to take them away, on account of the difficulty of adjusting. You get an illustration when Dall puts in a closely fitting piece of dovetailed work, but the wider and the worse the fit, the quicker the decay will go on. We have heard to-day that even the best gold workers cannot fill all teeth, and so it is with bridge workers. I have come to the conclusion it is a choice between durability and "show" and I explain the situation to my patients, leaving him to choose between the two, a full crown or

a three-fourths cap. There again I am advocating the utilitarian, but the artistic side must also be kept in mind.

Dr. L. J. MITCHELL: Does the three-quarter cap apply to bicuspid or in reference to the six anterior superior teeth?

Dr. CUNNINGHAM: My experience in actual practice has been more in regard to bicuspid, and I only allude to other cases and canines, because it is something akin to the other. I should prefer for safety and durability the fenestrated cap with the band coming in front at the cervical margin than I would depend upon the appliance just presented. An illustration of this subject is shown in Dr. Spaulding's case here with this movable pin, which we ought to notice as being very clever and seems a new idea. The only question which puzzles me is the question of cleanliness, and inasmuch as the majority of patients who wear bridge work are not of the ideal kind, I should fancy a simple bar bridge would be better so far as the molar and two bicuspid are concerned, because there would be a difficulty of keeping this part thoroughly clean. In any case it would be better still if these teeth were raised from the gum and a space were left open, it would then be perfectly possible to take a piece of chamois leather and keep it clean.

Dr. SPAULDING: In cases that I have made, which are being worn, the teeth simply approach the gum, and there is ample opportunity for cleansing.

Dr. CUNNINGHAM: It is easier to keep porcelain clean than gold.

Dr. DABOLL: I think you find the same difficulty with bridge work as you do with everything else. Some patients keep their natural teeth clean, and if they do that, they will keep plates or anything else clean. I do not know why that should be any argument in disfavor of the plate or bridge. I tell my patients what they must do, and there my responsibility ends.

I have had excellent success in the majority of cases, and sufficiently so to enable me to say that I consider it a good practice to place bridges within a reasonable limit.

Dr. W. MITCHELL: I think Dr. Daboll has about hit the nail on the head. It must be left to the individual opinion of the operator and the surrounding conditions in which he puts his bridge in. The density of the tissues must be taken into consideration, and there are a number of surroundings that must be borne in mind. This has suggested to me something which I saw a few

years ago in the mouth of a gentleman wearing a plate. The gentleman had been wearing a plate with an upper incisor put in by a dentist in Birmingham, which had been in the mouth for nine years; the plate was a little larger than a sixpence. It was impossible to do anything for one of the centrals where there was the trouble. I looked at the plate, there was the surface fitting down upon the gum for the space of nine years. Things were in a perfectly normal condition as far as color and the general appearance of the tissue was concerned. The plate was slightly discolored; as slight deposit of mucus, such as most of us will find on our teeth every morning. I was impressed with the possibility of the fact that it might be that in a healthy subject as he was, and under normal circumstances, the mucus that was given off under these places would throw everything else out, if it approximated close enough to exclude food, and whether my opinion is correct or not, I leave it to you to judge. I think where a piece fits snugly upon the gum without producing strangulation, that is the best way to have it.

Dr. RATBUN: I put a cap on an upper superior molar nine years ago. The molar had closed up the spaces a good deal, and to fill the spaces, I took an English gum tooth, and made a little gold saddle to fit the gum. Six or seven months ago, that patient came in, and I made some excuse or other, and I cut down the inside of the point of the gold crown, and took it off merely to see what was the condition of the mucous membrane under that saddle. It had imbedded itself a shade beyond the gum, and without saying anything to the patient about it, I simply soldered it on again.

Dr. W. MITCHELL: What was the condition of the under side of that gold plate?

Dr. RATBUN: It was oxidized; there was nothing on it, it was clear. There was only just a change of color.

Dr. DABOLL: I recently was obliged to take off a crown which I had put on five years ago. I had to take the porcelain off and cut through the gold, and drill out the pit as best I could. I was anxious to know what the condition of the tooth was going to be under the cement, and it was absolutely free from any septic condition. If the fitting is closely made, and does not go too far up on the root, this perfection may be reached.

Dr. C. W. JENKINS: I agree very heartily with Dr. Campbell in his estimate of the value of nice fitting mechanical work where

there is no cement used in movable bridge work, but I do not believe that it is always practical, for the very reasons which he alleges. There are few dentists who can afford the time to do it, for the money which they can get.

At the same time I think there is a place for cemented bridge work still ; in many cases I think it is useful. I do not believe in putting it in with a lot of cement. I think that one should use all the skill they can, and the less cement the better, for we know that anything to be properly adjusted should be put in with as little cement as possible.

Dr. L. J. MITCHELL: I am using less cement now than I have ever done before. It is not at all pleasant for the patient for the first hour that the cap is put on, and there is a better opportunity for cement to disintegrate than any other material I know of. What we use more than anything else is Hill's stopping, with eucalyptus and by getting the crowns fairly warm, a little attention on the patient's part will assist them right home. The superfluous amount of gutta-percha that comes away afterward can be removed. I do not know of a case where we have had any trouble in that way.

Dr. MONK: I would like to ask Dr. Mitchell how he gets rid of the superfluous gutta-percha, and how he can be sure that the exact quantity is there?

Dr. L. J. MITCHELL: You get it fairly warm, and you know that with a considerable amount of eucalyptus you will have no more trouble ; with the exudation coming out in that way, mastication will very soon put the crown up to place, so that the superfluous gutta-percha will come away, but with the cement there is no possibility of its going up to its place. You will find that you can put a crown on in this way, and inside of two minutes you will have no inconvenience from it.

Dr. CAMPBELL: I think oil of cinnamon is a better solvent and antiseptic than eucalyptus.

Dr. W. MITCHELL: In connection with this very good suggestion of Dr. Campbell's, there would only be one objection, and that is its pungency. There is a slight turpentine taste about, and its great persistency might possibly be, as I have found in my own mouth, a slight objection with some persons.

Dr. THOMAS: I have used a great deal of gutta-percha in the setting of crowns, and I find that the rubber glue is the best, such

as is used in factories—coal tar, naphtha and pure rubber—just saturate the gutta-percha ; and that softens it up, so that you can put it perfectly home, and afterward it evaporates and leaves the rubber perfectly solid. That is my experience.

Dr. SPAULDING: If there is still time I should like to show you some appliances made by Mr. Michaels, of Paris. He is very ingenious in mechanical matters, and has coöperated with Dr. Péan, a very well-known surgeon in Paris, and they have collaborated in making a man a new shoulder joint and putting it in. The man was presented before the school in Paris, and the subject, who was wearing a similar apparatus to this one, which they made for him, was present at this banquet without any one knowing who he was until he came to be presented. I have here photographs of the man and photographs of the apparatus.

I would also like to present another apparatus, which is also of very great interest, made by the same man. I saw the presentation of this at Dr. Péan's clinic ; the man was there, and drank and took some nourishment before the assembled students and members of the profession who came to see it.

The patient had had a cancer of the alimentary tract, and the whole thing was cut out and a new throat, so to speak, made for him. I do not know enough about it to go into a detailed explanation, but it was considered a very ingenious affair. I think Dr. Davenport here can tell us more about it, as he was then present. There is literature here on the subject, if any one of you wish to look into the matter.

ALUMNI CLINIC.

Third annual reunion and clinic of the Alumni Association of the Chicago College of Dental Surgery. Reported by R. C. Brophy, M. D.

The Alumni Association of the Chicago College of Dental Surgery, convened for its third annual meeting at the college building on Monday, Jan. 21, 1896.

CLINICS—CONTINUOUS GUM WORK.

Dr. L. P. Haskell gave a most interesting demonstration of the complete process of making a full upper continuous gum plate, baking same in the Custer electric furnace. Dr. Haskell regards

continuous gum plates nearer perfection than all other artificial dentures.

Porcelain face bicuspid all soldering being done in the flame of a Bunsen burner, with absolutely no investment. By Dr. A. H. Peck.

FILLING ROOT CANALS WITH METAL.

Dr. H. A. Costner, of Chicago, demonstrated his method of filling canals with metal, and advanced convincing arguments as to the advantages of the system. The metal in the form of foil (gold, platinum or tin may be used) is rolled into points and thus used.

FILLINGS WITH PLATINUM AND GOLD.

Dr. J. E. Hinkins, of Chicago, inserted a large mesio-occlusal filling of platinum and gold, in a right central incisor, for one of the college students, a very beautiful filling, much whiter and less conspicuous than gold.

ELECTRIC FURNACE.

Dr. L. E. Custer, of Dayton, Ohio, had in operation an electric furnace for porcelain work, and baked the case which Dr. Haskell constructed in his clinic. The work of the furnace seemed to be perfect, and the sentiment prevailed that to Dr. Custer is due the credit of bringing out the greatest of the more modern inventions in dental appliances.

ORTHODONTIA.

To change the position in the alveoli of the teeth by the skillful application of force is successfully accomplished by many practitioners. To undertake, however, a case of orthodontia in which a marked change in the form of the maxilla itself is demanded, requires a degree of confidence in one's capabilities possessed by few. Two such cases were exhibited by Dr. C. S. Case, of Chicago, and so effectively had the work been done, and so perfect the results, that they commanded general admiration.

A METHOD OF BACKING ORDINARY VULCANITE BICUSPIDS WITH GOLD AND USING THEM AS SWING TEETH OR DUMMIES.

This method of applying the full cusped vulcanite bicuspid in crown work was shown by Dr. F. F. Fletcher, of St. Louis, and much admired. The method consists in filing the heads from the pins of the tooth, attaching the end of a strip of thin gold plate to the pins, drawing the strip tightly around the buccal surface,

clipping out all of the plate on this surface except a narrow strip along the cervico-buccal margin, attaching the other end to the pins and soldering, thus forming a gold cap, the backing and cervico-buccal strip being continuous.

ALUMINUM PLATES.

Dr. G. D. Sitherwood, of Bloomington, Ill., demonstrated a method of preparing aluminum plate for swaging, and swaging same. In preparing the plate Dr. Sitherwood places in contact with it rice cloth and runs it through rolls; this slightly corrugates the surface. These corrugations assist in retention of the plate, air chambers being dispensed with in all cases. In annealing, no oil is used. Tissue paper is placed between the die and counterdie and plate, and a rim is turned.

GAINING SPACE, AND THE USE OF METAL STRIPS AS MATRICES.

Dr. T. E. Weeks, of Minneapolis, showed how he gains space by the use of gutta-percha, and demonstrated the advantages of using metal strips as matrices in condensing gold against approximo-lingual margins when the space is restricted.

GOLD FILLINGS, USING FELT GOLD.

Dr. W. A. Stevens, of Chicago, filled a mesial cavity in an upper right lateral, using felt gold. The operation was beautifully performed, and very closely watched.

THE MANUFACTURE OF NITROUS OXIDE GAS, AND ITS ADMINISTRATION IN EXTRACTION.

Dr. L. W. Nevius, of Chicago, gave a very thorough demonstration of his special process of manufacturing gas, having a complete plant established for the occasion in the college infirmary, and in practical operation.

ELECTRICITY IN THE PRACTICE OF DENTISTRY.

Dr. H. B. Wiborg, of Milwaukee, exhibited his very complete electrical bracket, probably the most complete electrical outfit upon the market. It was much admired.

APPLIANCE FOR REDUCTION OF ANEURISM.

Dr. H. J. Goslee, of Chicago, exhibited in position in the patient's mouth, an ingenious appliance for the reduction of an aneurism. The aneurism, located on the posterior or descending

palatine artery, postero-palately from the maxillary tuberosity, was of long standing and large size. The appliance consisted of a rubber plate accurately fitted and rigidly clasped to the teeth, with a second plate or disk, also of rubber, made to rest upon the aneurism, and attached to plate number one by hinges, a spring being so attached to the two plates as to exert constant pressure upon the dilated artery.

MEDICATED HOT AIR AS AN OBTUNDENT OF SENSITIVE DENTINE.

Dr. W. H. Simmons, of Decorah, Iowa, exhibited a compressed air appliance which is attached to the operating bracket, and is so arranged that independently of the operator's hands, a continuous spray of hot air, medicated if desired, is thrown into the cavity as the process of excavation goes on. If hot air is a good obtundent, which seems to be generally conceded, then Dr. Simmons' appliance must have merit.

METHOD OF PREPARING MATERIALS USED IN THE CONSTRUCTION OF REGULATING APPLIANCES.

Mr. C. B. Case demonstrated methods in vogue in his father's laboratory, of preparing rods, bands, etc., for use in the construction of regulating appliances.

PORCELAIN INLAY.

Dr. C. N. Thompson, of Chicago, made and inserted in a central incisor, mesial cavity, a porcelain inlay. The position of the cavity made the insertion of the inlay difficult, but it was successfully accomplished, and proved a very creditable piece of work.

ELECTRICITY IN ITS RELATION TO NERVOUS FORCE, ARTIFICIAL RESPIRATION, ANÆSTHESIA ASPHYXIA.

Dr. W. C. Barrett, of Buffalo, N. Y., sacrificed many animals in his very practical demonstrations of normal organic action, and various functional disorders purposely superinduced, vivisection being employed. Perhaps as interesting as any he did, was the administration to the death to a rabbit, of illuminating gas, and simultaneously and in equal volume to another rabbit nitrous oxide gas, the death of the former preceding that of the latter by only two seconds.

A NEW METHOD OF FITTING BANDS TO ROOTS THAT ARE BURIED BENEATH GUM TISSUE.

Dr. W. H. Taggart, of Chicago, demonstrated a method of

overcoming the most serious of these difficulties, and fitting bands accurately to roots where there is even but slight projection from the line of the alveolus. Briefly Dr. Taggart's method consists, after first leveling down the root, in taking a piece of pink gutta-percha and after slightly softening it, pressing it firmly upon the root, this gives an accurate impression of the outline of the root. This impression is then imbedded in plaster, a smooth surface being left all around the imprint, and on a level with it, a rubber tube $\frac{1}{8}$ or $\frac{5}{8}$ inch in diameter is then set over the impression, and the lowest fusing metal obtainable is fused and poured into the tube, and directly upon the gutta-percha impression. This gives a model of the outline of the root, on the end of a metal cylinder, the end of the cylinder is then carved down to the outline, and a perfect model of the root, in metal is the result. Upon this model the band is fitted.

OXYPHOSPHATES.

Dr. W. V.-B. Ames, of Chicago, exhibited a collection of leading oxyphosphates, all undergoing the test of immersion in an alkaline solution. All stages of dissolution were noticeable, the "non-irritant" cement made by himself seemingly standing the test the best.

EXCISION OF THE INFRAORBITAL NERVE.

A surgical operation commanding keen interest was performed by Dr. Truman W. Brophy. A woman, Mrs. A. R., a native of Austria, age thirty years, had for a period of five years, suffered almost constantly with pains of a neuralgic nature, seated in the region of the right superior maxilla. Though many efforts had been made to gain relief, through the administration of remedies, and local applications, none had ever been successful. When the patient first presented herself to Dr. Brophy, a careful examination was made, and the morbid condition pronounced neuroma on the infraorbital nerve, and the operation of neurotony was decided upon.

The operation, briefly described, consisted in making an incision commencing just over the right lateral incisor and extending to a point opposite the first right molar. The soft parts were then elevated until the infraorbital foramen was disclosed, when with a tenaculum the nerve was grasped at its exit from the foramen, at which point the neuroma was found. The diverging

branches were then dissected out, the trunk was seized by forceps, drawn forward or out of the foramen about one inch and excised. The wound was then cleansed antiseptically, iodoform gauze was placed in contact with it, and the patient dismissed.

While the operation of neurotomy has long been practiced research of the writer has failed, thus far, to find another case recorded where an operation for division of the infraorbital nerve within the foramen, has been performed without making an external incision.

The result of the operation has been gratifying in the extreme. The patient has, ever since the discomforts resultant from the operation passed away, enjoyed complete immunity from pain, and sensation of the part which was in some degree interfered with, is returning, and has already become almost normal.

In the evening a luncheon was served by Eckardt, and a long and very interesting literary and musical program was rendered.

THE USE OF PHOSPHORATED OIL IN DENTISTRY. By Herman Prinz, Halle, Ger. Phosphorated oil is a sovereign remedy for removing violent pain in periostitis resulting from a carious tooth. The cavity should be cleaned and dried and a few drops placed on cotton packed in the tooth, and is held in place by gutta-percha. The pain will vanish in a few minutes. It can be kept in the cavity for days and weeks to the greatest comfort of the patient. The action is not well understood, but Dr. Albrecht claims it is due to the fatty degeneration of the tissues brought upon by the phosphorus in this form. Phosphorated oil is prepared by dissolving 1 part of dried phosphorus in about 8 parts of heated expressed oil of almonds. The U. S. Pharm'œ preparation is 1:100. —*Ohio Dental Journal*.

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CARE OF THE TEETH.

Who prescribes the dentifrices? Do dentists supply even a small percentage of their clients with pastes, washes or powders? Recently, in looking over the various preparations in a druggist's establishment, we noticed more than forty different articles made by as many manufacturers, all to be used by our patients. Are they all useful or suitable for the proper cleansing of the teeth—natural teeth? Are antiseptics used in dentifrices? What constitutes a good powder or paste or wash for the teeth? Are washes or fluid dentifrices useful as detergents or friction producers when used for that purpose on the teeth? Are dentists giving the needed instruction to boys and girls or adults in the care of the teeth—such care as will insure cleanliness? We think they are not, judging by the results. How many times per day should the teeth be cleaned or brushed to prevent decomposable matters from exerting a deleterious influence on the teeth and gums? Is it necessary to do more than brush the teeth and gums with hot water and a suitable powder, or must the tongue and palate be brushed as well and as thoroughly as the teeth are brushed? Is it not time that thread and rubbers (rubber bands) and picks should be used between the teeth to remove perishable matters from the spaces, and then that teeth should be rubbed and scrubbed with brushes for at least five minutes, twice daily—say after breakfast and before retiring for the night. Are soaps useful in a dentifrice? Matters of this sort should be discussed in an intelligent, thoughtful manner at every gathering of dentists,

if their desire is to save teeth for use and comfort. A clean mouth is something rare to find, even in the best regulated families. Why is this so? We think dentists are at fault. They should demonstrate the methods of brushing the teeth and the whole mouth for every person who falls into their hands. They should teach that the thorough brushing of teeth is a necessity, and that some form of powder, without sugar or saccharin, or any sweetness, should be used daily. Any one eating raw fruits will not need the same amount of tooth brushing daily that a person does who does not or cannot eat such fruits *au naturel*. The liquid washes and antiseptics may be used after the teeth have been brushed, to clean the mucous membrane of the mouth, first using hot water to dissolve the mucus and saliva and gummy matters found in the mouth.

All powders should contain at least one ingredient not soluble in the fluids of the mouth, to assist in producing that degree of friction necessary to dislodge soft concretions. The simpler the powder the better for the patient. Most of the pastes and liquids are gotten up with the thought that they must be made like confectionery, pleasant to the taste, sweet in fact. This is a *mistake*. If we wish to save the teeth of the nation we must do it rigidly, and exclude all fermentable substances from powders and every kind of wash or paste. Will we do it? Now the most popular and salable preparations are foamy, sweet and aromatic; never detergent.

Who will be the first to inaugurate a reform on the above lines? Our pages are open for suggestions on the care of the teeth from infancy to old age. Will you assist in this reform? Will you begin to talk to and instruct your patients from this day what *not* to use on the teeth?

PAMPHLETS RECEIVED.

TRANSACTIONS OF THE CALIFORNIA STATE DENTAL ASSOCIATION.
Twenty-fifth Annual meeting, 1895. Secretary, W. Z. King, San Francisco, California.

MEMORANDA.

Englewood has a charter for a dental college.

Dr. D. J. McMillen was in Chicago to attend the clinic.

Only one dentist in Brownsville, Texas. More needed, so it is said.

Dr. R. N. Lawrance, of Lincoln, Ill., was a recent visitor to Chicago.

Dr. H. A. Smith, of Cincinnati, spent a few days in Chicago in January.

Drs. T. E. Weeks, N. S. Hoff and J. F. Stephan were in Chicago in January.

Dr. J. J. Reed, formerly of Chanute, Kansas, has removed to Rockford, Ill.

Dr. J. H. Woolley says that heat will embalm the root of a tooth—the inside of it so to speak.

Dr. D. O. M. Le Cron, of Rockford, has gone to South Africa to seek a fortune and practice dentistry.

Dr. E. B. Call, of Peoria, for many years a member of the Illinois State Dental Society, is deceased.

It is now stated, officially, that the Medical Congress of Moscow will be held in August, 1897, instead of 1896.

The New Orleans Academy of Stomatology dined at the Hotel Denechaud Wednesday evening, January 22, 1896.

Dr. S. H. Guilford has been elected dean of the Philadelphia Dental College, in place of the late Dr. Jas. E. Garretson.

The speaker intended to say "we will now lay back the nasmyth membrane, insert the filling, leaving the surface granular and then stitch the edges so as to cover it, thus making a perfect tooth!"

Dr. Henry W. Morgan, of Nashville, Tenn., was a visitor to the clinics of the Alumni Association of the Chicago College of Dental Surgery, in January. Dr. Morgan is the editor of the *Dental Headlight*, one of our best quarterlies.

Dr. E. C. Kirk, of Philadelphia, the new Secretary of the Dental Department of the University of Pennsylvania, spent a few days in Chicago with Dr. C. J. Essig, visiting the dental schools of Chicago, late in January. Both of the gentlemen have been making a tour of the country, visiting nearly all of the schools east of the Rocky Mountains.

ST. LOUIS DENTAL SOCIETY.

The following officers have been elected by the St. Louis Dental Society, to serve during 1896: President, F. F. Fletcher; Vice President, J. S. Coyle; Corresponding Secretary, J. G. Harper; Treasurer, A. J. Prusser; Recording Secretary, P. H. Eisloeffel; Committee on Ethics, W. M. Bartlett, P. H. Morrison, T. L. Pupperling; Committee on Publication, De Courcey Lindsley, Wm. Conrad, J. P. Harper.

F. F. FLETCHER, *Corresponding Secretary*

The Eighth Annual Dinner of the Odontographic Society of Chicago, was given at the Club House of the Chicago Athletic Association, Monday evening, January 13, 1896. Over eighty members were in attendance. Dr. G. V. Black, of Jacksonville, Ill., made some tests and explained the subject of "The Shrinkage and Expansion of Amalgams."

The Illinois State Board of Dental Examiners will meet in Chicago, March 21, 1896, at the Sherman House, for the purpose of examining candidates for license and the transaction of any other business which may come before it.

L. L. DAVIS, Secretary.

All names should be sent to the Secretary at least one week prior to meeting.

January 27, 1896.

TO THE EDITOR OF THE DENTAL REVIEW.

Dear Sir :—Noticing several articles upon anchoring large contour fillings in incisor teeth in recent numbers, have reminded me of a method suggested by E. Parmly Brown, *Dental Cosmos*, Vol. XVI., June, 1874, page 333. There is a vein of sameness in the methods that may be of interest, the differences may indicate changes a score of years have wrought. I have written this thinking perhaps some of your readers may be pleased to compare the present with the past, and also that Dr. Brown's method may sometime be remembered with profit.

Yours respectfully,

WILLIAM H. TRUEMAN, D. D. S.

900 Spruce Street, Philadelphia.

TUBERCLE BACILLI IN MILK.

Obermüller (*Hygien. Rundschau*, 1895, No. 19) undertook to examine milk purchased from dealers, for the presence of tubercle bacilli, because it seemed probable that, in view of the large number of tuberculous cows, bacilli would often be present in milk. He therefore injected into the peritoneal cavity of forty guinea pigs 2 to 2½ c.c. of milk. Of these forty, three died from extensive tuberculosis of the peritoneum. In a second series of experiments the author used the sediment of centrifugalized milk mixed with the cream of the same milk, because it was learned from control experiments, that bacilli in centrifugalized milk not only reach the sediment, but also the layer of cream. With this mixture he injected intraperitoneally twenty-six guinea pigs, giving each 1 to 1.5 c.c., and of these ten, or 38 per cent, died from tuberculosis. Inasmuch as boiling as well as pasteurization of milk in reality are only palliative measures, he advocates strongly the weeding out of tuberculous animals after testing with tuberculin.

OBITUARY.

STILLMAN R. BINGHAM.

Died February 1, at Highland Park, Ill., of pneumonia, Mr. S. R. Bingham, aged 66 years.

According to the light of human judgment this man should not have died. He was too useful, too honorable, too loving and much beloved to make his death anything but deplorable. And yet in view of what he had accomplished, his life was well rounded out and full of fruitage. He came to Chicago in 1858 as the representative of S. S. White, and had resided here ever since. In that time he endeared himself to a large circle of friends, and to them came the news of his sudden death with a sense of shock. No man drew warmer and closer friendships or held them more securely than did Mr. Bingham. His individuality was pronounced and to meet him once was ever to remember him.

Strong as a lion in defense of what he believed to be right, he was yet by nature tender, charitable and compassionate. He rebuked wrong wherever he encountered it, but his rebuke was invariably softened almost into a benediction. He was pure minded to an exalted degree and held a refining influence over all about him.

To family ties he was bound by bands stronger than the strongest steel, broader than the breadth of worlds, he was bound by the precious bondage of a pure and loyal love. Motherhood was to him the most sacred thing on earth, and a babe in arms was a supreme blessing. His love of children passed all understanding, and the mere mention of a childish trait was sufficient to bring the moisture to his eyes. Cast in a noble mold he was at the same time manly and modest, confident and cautious, brave and benign. He was a many-sided man.

Along the pathway of life he spread the perfume of kindness and encouragement, and was ever prodigal of good in word or deed. Many to-day are mourning the loss of a counselor and friend whose place will not soon be filled. He has left behind a heritage more precious than material wealth, the record of a life well lived. To this, in their hour of bereavement, his family and friends may turn with the consolation that in the final sum-

ming up of all things good or great, there is nothing nobler than the living of a perfect life.

His demise removes from our midst the man but not the reminiscence. In the hearts of many friends he planted, with loving touch, the seeds of sweet forget-me-nots, and while we bow our heads in humble reverence and mourn that he was taken from us, we yet may feel the fragrance of his memory as it lingers with us.

The DENTAL REVIEW expresses sincere sorrow. C. N. J.

CHARLES JAMES FOX.

One of the once best known leaders of dentistry in England died on the 4th of last month from an overdose of chloroform, in Gravenhurst, Ont., in his sixty-sixth year. Owing to some trouble in England he gave up a lucrative practice in the West End of London and came to Canada with his son and a female assistant, and took up a free grant of land in the township of Wood, trying his hand at farming, but his skill as a dentist becoming known, his services were sought after by a large number of people in the town, which ultimately necessitated his removal to Gravenhurst. Only a short time ago he bought a property which he named after the old family residence in London, "Holland House." It was largely by his efforts that the profession became a corporate body in England. He received a testimonial signed by all the leading dentists in Great Britain, accompanied with a purse of one hundred guineas. As editor of the *British Journal of Dental Science*, his name was associated with the contests against quack advertising, as well as many various reforms. Last winter his wife died from an overdose of chloroform which she took to relieve severe neuralgic pain.—*Dominion Dental Journal*.

THE DENTAL REVIEW.

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No. 3

ORIGINAL COMMUNICATIONS.

THE REWARD OF CONSCIENTIOUS WORK.*

BY C. N. JOHNSON, L. D. S., D. D. S., CHICAGO, ILL.

[The following lecture was delivered in response to a note sent down to the professor by one of the students to this effect: How is a young man starting in practice to follow out the ideas taught him in college, and do work up to the standard required of him here, when he has to compete with men whose fees are so low that good work cannot profitably be done for them?]

Gentlemen: The answer to this query involves the consideration of a very important phase of professional life. It touches a question of the most vital interest, not only to the recent graduate, but to a large body of men in the profession who have felt the discouragements of long continued endeavor in the face of obstacles such as are indicated in the question. Nor will it do for us in considering the matter to view it entirely from a broad and general point of view with the off-hand argument that right must eventually prevail, and that honesty is the best policy. This would be the form of treatment most naturally suggested for consideration, but we must descend into the details of the question and meet the matter squarely from a practical point of view if we wish to teach the most lasting lesson.

A young man is graduated from college and opens an office. His competitors are doing work for fees that do not seem to him to be remunerative. He examines their work and finds that it is far from coming up to the standard taught him in college, and yet the men doing this work are probably held in esteem by the peo-

* Lecture delivered to the class of the Chicago College of Dental Surgery.

ple as dentists of good repute. A temptation immediately stares that young man in the face. Why not follow the example of the other men, do work of the same character and reap the same reward? The public are seemingly not informed as to the merits or demerits of dental service anyhow, and it is a waste of energy to try to educate them. Possibly at this stage the recent graduate may encounter the example of some man in the profession who is recognized as a skillful, painstaking operator, but who has long ago been left behind in the race for money by men who are far from being his professional equals.

The young man does not stop to consider that financial success requires the presence of other qualities besides the ability to do good work, and that possibly the operator in question lacks those qualities. He jumps at the conclusion that to do the highest type of service is a useless expenditure of time and energy which will not be appreciated by the people, and that while the high ideals outlined by his professors may be all very well for college teaching, yet something less exacting will answer a better purpose for actual everyday practice. This is a dangerous condition of mind for a young man to approach, and I wish to present to you this evening two pictures, one each of two young men following different lines of procedure after graduation, and to ask you when these pictures are drawn to decide for yourselves which you wish to emulate. I shall endeavor to outline the career of each of these young men with absolute realism, adhering as closely as I may to what I believe to be the inevitable result of the two different methods of practice.

One young man after opening an office surveys the field carefully with his weather eye out for the main chance. He sees that work is being done around him at low fees, and he recognizes the fact that for a young man to start with higher fees than are obtained by old established practitioners in his immediate neighborhood is well-nigh suicidal. He argues with himself that no man can do high grade work for low fees, and with these two ideas in his mind it is only in accordance with the common frailty of human nature for him to begin to slight his work. At first he avoids doing really disreputable work. In fact it is never in his mind to be disreputable. He simply takes less pains with his work than his professors in college required of him. All the while he is priding himself that he is really doing work that will last. It is only in minor matters that he hedges here and there. If he chances to check

the enamel margin while inserting a gold filling he will burnish the gold over the crumbling prisms and fondly hope that it will do. In the preparation of a cavity he finds that it takes time and patience to extend the outlines in accordance with the principles laid down in college, and so contents himself with merely drilling out the decay and inserting the filling. To properly bevel an enamel margin requires closer attention than he feels disposed to give it, and in any event no one can tell after the filling is inserted whether the enamel is beveled or not. In molars and bicuspid he finds fissures extending from cavities, but argues that there is no actual decay in the fissures and that it is therefore folly to invariably drill them out to the end. He claims to have seen fillings lasting well where fissures have been left untouched, and takes it for granted that his fillings will stand a similar test. In the treatment of pulpless teeth he sees cases where roots have remained comfortable for years without any filling, and other cases where filling has seemed to invite trouble. He hears from so-called high authority that if roots are to be filled, cotton is a good material for the purpose, and readily lends his ear to this fallacy because cotton is so easily inserted.

If he encounters a case where the canals are difficult of access he remembers that some one has advocated the sterilization and mummification of the contents of such canals to avoid the necessity of cleaning them out. The temporary immunity from trouble in many cases of pulpless teeth treated by these methods emboldens him to greater and greater laxity till he reaches the point where he considers the time spent upon the treatment of pulpless teeth as practically thrown away. He argues that work of this nature is seldom paid for proportionately with other dental service, and that he can make money faster by filling ordinary cavities than by treating roots. This idea in the end leads him to advise the extraction of many teeth that might well be saved.

In the selection of filling materials he early learns that amalgam has allurements to both patient and operator, and that to live up to the gold standard requires a degree of discipline and a striving after high ideals that he in his present mood is not inclined to subscribe to. He can make money faster and easier by filling everything with amalgam than he can by judicious and reasonable use of gold, and he dabbles with the former till his fingers lose their cunning and his ability to do good gold work is diminished.

The avoidance of complicated operations with gold robs him of the stimulation to be had only by meeting and overcoming difficult problems, and leaves him with a gradually lessening mental and physical capacity that sooner or later throws a blight over his whole professional career.

And yet up to this time the young man has seemed to be sailing in waters that were reasonably smooth. He has not yet begun to reap the fruits of his thoughtless sowing ; but a day of reckoning is sure to come, and no man is more miserable than he who has to account for careless dentistry. Some day a patient will present with a gold filling failing where he had burnished against a checked enamel margin. He explains the matter as best he may, but the filling must be reinserted. He cannot demand a fee for this proportionate to the time required, and often he dare not demand a fee at all. In the course of events, patients begin to return to him with a peculiar form of failure that he had not suspected. At first he is not seriously disturbed by it, because he has a ready means of shirking the responsibility. His fillings perhaps have not loosened on account of the fact that in those early days of operating he intuitively has in his mind the exploring probe of his examiner, and he has formed the habit in college of anchoring his fillings securely against this form of dislodgment. But he is confronted with annoying recurrences of decay around margins that he felt certain were perfect when he finished the filling. He notes that these recurrences manifest themselves at the points where his professors had taught him to extend the cavity in its preparation, and then he sees for the first time the full significance of the term "extension for prevention." But he is not altogether daunted, for he is able to say to the patient that his filling has not loosened, and that the failure is due to the fact that the tooth has decayed around it. The intimation is thus made that there is no fault in the work, and whether or not the conscience of the dentist is always easy, the patient is in many cases convinced, and the operator thinks he has ridden over a difficulty. But the end is not yet. After repeated failures of this kind the patient loses faith in the efficacy of dental operations, and a two-fold injury is done. Money is taken for services that were not worthy, and the patient is driven to neglect the teeth and to induce others to do the same through a misconception as to the value of dental operations. Even where the patient persists in

trying to save the teeth in the face of repeated recurrences of decay, the experience to the dentist is not very pleasant nor inspiring. Adequate remuneration cannot be had for operations that are repeated again and again, and the operator sooner or later begins to sicken of his own failures. But probably the bitterest cup in his measure of humiliation presents itself in the form of abscesses following his management of pulpless teeth. Patients apply with terribly distorted features, and exhibiting every evidence of the most intense suffering. They clamor for relief, and when he cannot succeed in giving them immediate relief they censure him for having placed them in such a predicament. Surely his chickens are coming home to roost.

Chronic abscesses continue to confront him at every hand, and he finally begins to dread to see a patient for whom he has filled a pulpless tooth. In fact, the alarming per cent of failures in all lines of his work makes his practice a dread from day to day. He grows weary of trying to explain away this failure and that failure, and finally longs to get away from it all, and go to some other locality where his failures cannot follow him. In the end he has made neither reputation nor money out of his lax methods of operating, and he considers the practice of dentistry altogether unsatisfactory, and wishes he had gone into some other profession.

This young man probably left college with good prospects. He was as well equipped as any to go out and win success. He had the ability to do good work, or at least the ability to become able to do good work. His professors in college had taken pains to instruct him in all the latest methods of modern dentistry. His friends expected much of him, and counted on his making a record for himself. He had the world before him with everything in his favor, and yet he sacrificed it all on the altar of a false purpose. He has learned when too late that nothing retaliates on a man so surely as poorly performed dental service, and instead of winning the competence he had expected he has destroyed his chance of making anything more than a mere livelihood.

The other young man referred to leaves college under similar auspices to the one just described. He opens an office and surveys the field, and when he finds that his competitors are doing work for small fees he argues that he, a young man just starting, can surely afford to work for the same fees that older men are satisfied with. His time is not all occupied at first and this gives him

the opportunity of taking the very greatest pains with what work passes through his hands. He realizes of course that he cannot always work for low fees and consequently must endeavor to so entrench himself in the confidence of the people that they will eventually submit to a rise of fees without leaving him. He sees that the surest way to accomplish this is to do the very best and most permanent work. His competitor's work is not up to the standard else they would not go on year after year working for unremunerative fees, and he sees an opportunity here of gaining a decided and laudable advantage over them by establishing a reputation for doing better work than they. This inspires him to the highest endeavor and his patients soon begin to realize that they are in better hands than they have ever been before. Every perfect piece of work is a twofold victory. It clinches the patient's confidence and it makes the operator more nearly a master of manipulation. Soon the constant endeavor to do the very best renders the very best easy to do, and he has so formed the habit of painstaking care that it has become second nature to take pains. A good operation then is only a matter of fact, while a slovenly one would haunt the operator as something uncanny and unnatural.

By following this line the young man is eventually enabled to do the best work with as little effort and in as short a time as his competitors are doing the poorest work. He has developed into a man of greater skill than they, and the people are quick to recognize it. He finds when he starts to practice in the neighborhood, that too much amalgam is used for the good of the profession and the people, and he gradually induces his patients to have gold in suitable cases. At first he finds it impossible to obtain adequate remuneration for his gold work, but he may as well fill all his spare time by being occupied at the chair and he tells his patient frankly that in order to prove the advantage of gold he is willing to insert it at a minimum fee. In this way he introduces gold and creates in the mind of his patient a desire for higher class dental service. After a few years the patient sees what a properly inserted gold filling will do and willingly pays a remunerative fee for further gold work. The young man is rapidly becoming recognized as a dentist of superior ability, and his hold on the people is growing firmer every day. He is ever on the alert for means to strengthen his position, and he sees many opportunities besides the mere performance of good work to accomplish this result. He

discovers the fact that to be a perfect gentleman in all that the word implies is a wondrously strong card. Personal cleanliness he finds to be at a premium. Clean, soft hands, with supple fingers do a deal of advertising for him. He looks about his office to see in what particular he may make it more attractive. Snowy linen about the chair—linen of as fine quality as he can afford to buy—proves an alluring feature for the ladies, and the cuspidor and instruments always clean and sweet he finds acceptable to every patient whether lady or gentleman.

Soon this young man has all the practice he can attend to, but as before intimated the prevailing fees are lower than they should be, and he must needs get more for his time in order to substantially provide for the proverbial rainy day. The process of advancing his fees is a delicate one and must be met with some tact, but the young man is by this time familiar with the situation, and his close study of human nature as manifest in his patients has given him the key to the proper course. In the end he finds himself with a full practice at remunerative fees. Not only this but his professional life grows more and more attractive each year. It is a pleasure instead of a dread to have his patients return from time to time. He sees in their mouths the products of his early care, and hears from their lips the commendation which after all goes fully as far as money to make a professional life worth living. He has made staunch and loyal friends of his patients, and feels that he has accomplished something in the world besides the mere accumulation of dollars and dimes.

Here are two pictures. They are not overdrawn, and while each may appear an extreme case, yet they are the exact counterparts of those in actual existence. I leave it to you to select which you are to follow. There are varying grades between these two, but it becomes your privilege to be either the worst or the best of those I have depicted. You are just now in your formative stage, and the future success of your professional life depends upon which side you cast the die. The few words that I may say to you to-night can contain no argument so potent as that of the examples to be seen in every day life if only you have the opportunity and the desire to look for them.

The simple facts are these: that careless work will not pay either in a financial or professional way, and that good work will pay even though the reward may sometimes be long deferred.

Look at the names of men in the profession with whom you would like to have your name connected as a peer, and see whether or not they were men who slighted their work. You have before your eyes every time you enter this lecture room the example of a man whose great renown in his profession, and whose substantial reward from his patients was the result, not of a desire to compete with his fellow practitioners in fees but to do work that would stand the test of time. The man whose medallion likeness looks down upon you at every lecture was not influenced in the performance of his duties by the size of his competitor's fees. He came to Chicago a young man imbued with the spirit of a high ideal in his work, and he never wavered from that ideal in all the years of his practice. He cared more for the quality of his operations than he did for the fee bill of his fellows, and the consequence was that in the end he was enabled to command higher fees than they, and his manipulation was masterly up to the very latest hours of his practice. Such an achievement as his should prove an inspiration to every young man to always do the best that in him lies, and it is only by studying the careers of the great men of the past that the young men of the present may learn the possibilities of their own future.

I have taken advantage to-night in answering the query sent down by one of your number, to speak at some length on a subject that I have long felt to be of the greatest moment to young men going out to practice. I am here to make an earnest plea with you to establish in your minds the highest ideals possible. Remember that you will never climb higher than the point to which you aspire, and you will never climb at all unless you have the impulse of an honest endeavor. I am here to preach to you with all the fervency of an anxious advocate the gospel of good work. I believe that in this lies the only sure means of reaching ultimate and permanent success, and I sincerely wish for you each and every one a full measure of that success. If I could know that out of the young men listening to me to-night I might in future years read the names of those high in authority in the counsels of the profession, I should esteem it an honor that I had been called upon to be one of those who had helped in however slight a degree to direct your early efforts.

I trust that I may yet have that pleasure.

ORTHODONTIA.*

BY EDWARD H. ANGLE, D. D. S., ST. LOUIS, MO.

According to our literature it is now 351 years since we began the practice of orthodontia. Its history reads like a romance and is exceedingly interesting, showing, as it does, the various evolutionary stages through which it has passed and the wonderful unfoldings which have taken place in every phase of the subject. Its history is similar to that of most sciences in that ignorance and crudity of thought has been gradually eliminated and supplanted by knowledge of the truth and correct principles, until to-day, we can with truth say, the science of orthodontia has attained a high degree of perfection. The subject has been broadly studied, the etiology has been ably investigated and the state to which the regulating appliances have been brought is probably very nearly perfect, so that, with our present knowledge of the science, it is possible by beginning at the proper age, to bring about most wonderful results, even in patients afflicted with the most noticeable deformities.

Cramped and narrowed arches are now easily enlarged and made to assume that graceful form in harmony with the peculiar facial type of the individual; twisted, inlocked and outlocked teeth are made to quickly yield to the intelligent application of force and to assume positions of usefulness in the lines of beauty. In those marked deformities of orthognathism and prognathism the teeth may be adjusted, and the maxilla moved backward or forward until lines of facial harmony have been established, and last, and more important than all, the teeth may be brought in harmony with that great law which is the basis of all dentistry, namely, correct occlusion. Without this, no artificial denture, filling or corrected case of irregularities was ever yet a real success, for the establishment of perfect occlusion means the establishment of harmony throughout.

And yet, notwithstanding that orthodontia has kept apace with other sciences and other branches of dentistry, making all this possible, I am compelled to ask this humiliating question: Why is so little of this work done? Go where we will, wander down the village street, or the great avenues of any city, enter street cars or great churches, or theaters, or wherever humanity congregates and we will be confronted by these deformities until

* Read before the Western Odontological Society of Pennsylvania.

we are shocked at their prevalence. They occur in such numbers that they seem to be the rule rather than the exception, and in the mouths of many who would otherwise be regarded as beautiful. Nature has apparently been lavish with them in all else, and these same individuals, too, are oftentimes fresh from the hands of reputable dentists.

What is it? I confess the fact that it *is* so is to me a great disappointment, even conveying a sense of sadness. There must be something wrong somewhere. It is not so in other branches of dentistry, for it has seemed to me they, crowning for example, have been sometimes overworked. But why should orthodontia, the most fascinating, both in its study and practice and gratifying in its results of all the different branches of dentistry be so slighted? Certainly it is not, as I have shown, lack of material, and I believe there is no work the dentist is able to perform which brings him such gratitude and appreciation as a successfully conducted case of irregularities, not alone from the patient but from a large circle of friends and acquaintances. And I know there is a cultured and refined class of people in every community who are willing to pay well for intelligent efforts in this branch of dentistry, yet only a small percentage of those afflicted ever receive that care and attention which an intelligent appreciation of their true condition deserves.

Again, why is it? There must be a reason. Cause and effect always go hand in hand and surely here cannot be found an exception.

On this subject I have thought long and seriously. You will, therefore, permit me to give a mature opinion. It is this. The science of orthodontia possesses certain peculiarities so radically different from all other branches of dentistry and medicine that it is entitled to the proud distinction of being a specialty, and that too, having boundary lines more clearly defined than any other branch throughout the whole realm of medicine; and until it is taught and practiced as a specialty it can never fulfill our ideal. Who can doubt that it *is* a specialty of great importance? In proportion as the appreciation of art—true art—is developed will orthodontia be appreciated, for it has to do with the highest phase of beauty, namely the human face.

The lines of dentistry have grown so broad that no one can now hope to excel in all. The all around dentist is one of the van-

ished glories which will never again be even heard of, and he is wise who realizes that each separate branch contains enough for the best efforts of his life's work and does not try to monopolize all. Let each follow that special line best fitted to his inborn talents, aptitude and liking, and how much more useful such a life than one forced into abnormal grooves along which we must fret and blunder all the way. Let our profession rise to the importance of this fact and then, and then only, will we make the greatest, truest progress. In proof of this I have only to cite you our great mother, medicine, who, in order to progress in proportion to her importance has been compelled to pursue certain well-defined lines of specialization and since doing this she has made greater progress than in all former history. A failure to recognize and encourage specialization in dentistry, is, I believe, greatly handicapping its true progress, as, for example, failure to recognize mechanical dentistry as a specialty is rapidly placing this important branch in the possession of the quack. Will it be so with orthodontia?

All agree that orthodontia is the most difficult branch to master and, in practice, the most rigid and exacting in its requirements, of all branches of dentistry. Dr. Guilford, with truth, long ago wrote: "No matter to what degree of perfection the regulating appliances will yet be brought, there will still remain so many perplexing problems connected with each case that orthodontia must always be by far the most difficult class of work the dentist is called upon to perform." And yet in nearly every dental college it is taught in the most superficial manner. It seems to be regarded by both students and faculty in the light of a nuisance, something in the way of, and interfering with other, more important work. The student as he graduates possesses only the merest smattering of a knowledge of the subject; it but naturally follows such teaching.

Then, as to the attention it has usually received by the general practitioner, after the instruction he has received in college, is it any wonder he regards it as something to be dreaded and evaded? The few cases he attempts must be in the nature of experiments and many of them result in experimental blunders in which teeth are permanently elongated, pulps devitalized, teeth discolored, valuable teeth sacrificed, facial lines permanently marred, faulty occlusion established, an immense amount of pain inflicted, and time wasted.

Now, with such teaching in colleges and such treatment at the hands of the dental practitioner is it surprising that the public are deprived of the service which the great importance of their deformities demand, and that they have grown skeptical and regard orthodontia as a long, painful experiment with doubtful termination?

Gentlemen, orthodontia is entitled to better treatment. It can never succeed by being placed second to all else in dentistry. This is impossible from the very nature of its requirements. Gentlemen, it is too broad and great a subject, too rigid and exacting in its requirements, having too many difficult problems and obstacles to be overcome, to ever be mastered by second-rate appointment. Its requirements both in teaching and practice demand first-rate skill, and it is the height of absurdity to turn it over to the back office student or to attempt to sandwich it in with patients in general practice. One branch or the other must suffer seriously.

That operative dentistry monopolizes the best of everything in colleges is well known, and even then, it is difficult to turn out students who are approximately what they should be even in this branch. What, then, can we expect from the graduate in regard to orthodontia, a subject vastly more difficult to teach and master and which has been slighted throughout the whole course?

But how can this unfortunate condition be changed? The remedy seems not difficult, but most natural and easy, and I doubt not will surely be recognized in time. This is the plan I would suggest: Simply regard it as a specialty, teach it as such, and relieve the student in orthodontia from the study of mechanical and operative dentistry entirely. They are most demoralizing to the study of orthodontia, are of no use to him whatever, and are only a waste of valuable time. On the other hand, the student in general dentistry should not be compelled to study orthodontia. It is of no use to him and is fully as demoralizing as it is in practice to the general practitioner.

Eliminate its teaching from such schools as teach it for fashion's sake and because it has usually been regarded as quite ornamental in the annual announcement of the school, and teach it only in schools located in the largest cities where clinical material, so indispensable, can be secured in abundance, and which provide a most thorough, liberal and intensely practical course of instruction, covering at least three years and embracing anatomy,

physiology, chemistry, metallurgy, materia medica, and physics, the study of art as it relates to the human form and face, sketching under competent teachers. The study of anatomy should be most thorough, especially dental anatomy and comparative anatomy of the jaws and teeth. The student in orthodontia should also study pathology, especially as bearing upon the pathological conditions of the throat and nose, for the intimate relations existing between dental deformities and diseases of the throat and nose are too important to be ignored, and not until he has made some considerable advance in all of these branches should he be permitted to do more than practice in impression and model making. During the last two years four hours each day should be spent in actual clinical instruction under the most skillful instructor available, in addition to lectures and quizzes.

At graduation, such students would be abundantly qualified to begin the practice of one of the most useful, pleasant and profitable specialties in medicine. Such a course of instruction could probably be made to harmonize with the present dental curriculum.

See what a grand future there is for orthodontia! Not one single specialist in all London or even Paris, where there are thousands of the most wealthy and cultured people willing and anxious to pay for the best. Think of Chicago with one specialist to two millions of people with hundreds of dentists daily evading the work, and many other large cities wholly unrepresented. Every city of this size (Pittsburgh) should have at least one-half dozen specialists profitably occupied. The people take most kindly to this work as a specialty. I believe the time and conditions are ripe for the establishing of orthodontia in its true position, for I know there are to-day many of the best men in the profession in every city who are tired of this narrow, "dog in the manger" plan, and are anxious, and would be willing to refer their patients, if they could, to honest, competent specialists pursuing this branch only, knowing that by so doing they would be better served than they can serve them, just as does the broad and liberally educated practitioner of medicine, who now takes pride in referring his patient to the carefully educated oculist or rhinologist, and who, by so doing, uplifts his profession and benefits humanity.

DENTAL AMALGAMS.*

BY A. C. HEWETT, M. D., CHICAGO, ILL.

Keenly appreciative of, and grateful for the honor of the invitation to address you, I am as keenly appreciative of, and impressed by the responsibility assumed in its acceptance.

Were the members of this society on the plane of knowledge that dentists occupied thirty years ago, it were an easy task with even my limited acquirements to interest by a description of new appliances, new methods, new agents and theories.

But you, gentlemen, do not stand upon any such plane. In your hands are the same magazines that are sent to me. Facts that are such are as apparent to you as to me.

In what I shall have to say I shall not presume to enact the teacher, shall not enter the domain of the scientific. I shall use as few technical terms as possible and confine myself to what I deem the practical.

Should I use the term shrink or expand I shall not wish to be understood to mean that lessening or enlargement that can only be measured by a micrometer.

When I say white as applied to alloys I shall not wish to be understood as meaning that condition of the surface which shall reflect to the eye all the rays of the spectrum combined, but such a color as you would expect to find in alloys presenting a strong contrast to those now in general use.

When I say dense and hard I do not mean such density as the diamond possesses.

When I claim durability for the alloys, I shall not of course mean absolute indestructibility. Should I claim the alloys to be nonoxidizable I shall not mean that no microscopic film shall ever dim its luster, but that practically they shall not rust, corrode, or blacken. God never made a metal or fused a combination of them that will not shrink or expand under thermal influences; nor did He ever make anything that shall not under the abrasive influences of time and the elements dissolve and waste. I wish my language to be taken with a plain everyday practical meaning. I realize the fact that in some degree I stand before you at disadvantage. All of you have an especial education, many of you are possessed of great learning, some are celebrated teachers in colleges of renown. It

*Read before the Chicago Dental Society and the Tri-City Dental Society.

were almost invidious for me to mention names; but there are those whose mental capacities and acquired abilities are so great that one of far greater pretensions than is made by your speaker might well hesitate, especially in the advancement of that which seems new.

Many of you come fresh from college halls, where for some blessed years you sat at the feet of learned, broad minded, earnest men, who gave of their abundance. You had placed in your hands text-books fresh from modern presses, and filled with advanced ideas.

With substances named, ideas elaborated, processes explained necessary in laboratory, operating and chemical rooms, you are as familiar as with the letters of the English alphabet, while I, you have only to look at my whitened beard and hair, count the years of more than a half century back to the one in which I was born, so much too soon, to call forth that charity I shall need while before you.

The subject chosen for this paper will doubtless seem to you strange, perhaps ill chosen. But before you pass final judgment upon me and my subject, bear with me, with what patience is necessary, while I strive to awaken in your minds somewhat of the interest that for the last ten years has been growing and intensifying within me while giving careful study and painstaking experimentation to dental amalgams.

That there is need of an awakening on this subject, no close observer, or logical reasoner acquainted with dental processes and needs will deny. We have only to look into the mouths of patients that come into our several offices, strangers to ourselves, having been under the hands of dentists, alike strangers to us, to see that need. You may not hear it, but you can smell it, you can taste it through your olfactories; the odors surcharge you, and you feel it in the deep disgust that comes from the sight of the "black ditches" around the "Silver" plugs; ditches indeed that harbor putridity and rottenness; you can realize it as you pass the searcher around cervix and border, and its point comes in contact with softened dentine or impacted fermenting foods, and your patient may feel it too, as the searcher reveals a cavity where he supposed was security and preservation.

All our senses, except hearing, reveal this needed awakening every work day of our lives.

How many perfect amalgam fillings are thus presented to you in the course of a year? You can count them on the fingers of one hand, and could if part of them had been amputated. By perfect I do not mean microscopically so, but reasonably preservative so that the plug will remain, and bar moisture and prevent decay for six, ten or twenty years. Not counting the work of the few, and very few at that, the average life preserving duration of amalgam fillings is less than three years according to records and calculations I have kept and made. There have been workers (some have gone to their rest) and there are a few that show to you and to me that there is no need of such an average.

By their works we know that in amalgams properly prepared and skillfully placed there are great possibilities for good. Had it not been for these workers amalgams could never have fought their way to the front that they occupy, their worst enemies, their pretended friends. Had there not now and then been these cases of success, then I should unhesitatingly say amalgams and amalgam work should be discarded.

Were the general average to count, then tin were better, lead better, cements better, and gutta-percha infinitely better. But this disgraceful average must not, need not count. The bitter prejudice that I have held against it has melted away and the result of the nearly ten years study of metals, the discoveries I have made and the results of experiments laboriously and expensively conducted have made me almost an enthusiast in the belief of the possibilities in store for it.

Why amalgams are needed I do not think I will argue at length or the need of such a filling material or demonstrate why it is demanded. The fact that the large majority of patients cannot afford the cost of entire gold work need only be stated.

Why amalgams are the best substitute for gold now known, it may be well to dwell upon for a few moments.

There is no known substance nonplastic that can be securely packed in a cavity as a substitute for gold, that can bar fluids, preserve dentine and enamel, and bear occlusal strain and wear in all cavities.

Among the plastics aside from amalgam, Ash & Son, of London, demonstrated by a costly course of experiments that chemistry could not supply the need.

So for permanent work we are driven to gold alone, or gold

and amalgam. Such without doubt is the voice of the dental profession. Which shall it be, and which shall take precedence? Before my special study and experiments and the discovery following I should have said and did say gold, except as a makeshift. Now I say gold and amalgams (not one but several for different needs) and I now unhesitatingly say the amalgams should be preferred, and gold only used so long as fashion demands it and is able to pay.

I know that in saying this I may almost stand alone. It seems to be my lot to work with the minority, but I must follow my honest convictions no matter where they lead.

To be thus preferred amalgams should be of a *very high* order. Just a word as to terms. When I say amalgam I refer to a mixture one ingredient of which is always mercury. The other ingredients when not mixed I term metal if in the singular number, and alloys if more than one metal is used. A metal or metals does not and do not become amalgamated or amalgams till united with mercury. "Silver filling" is a misnomer and never should be used by the dentist.

I repeat that amalgams to take precedence of gold should be meritorious in a high degree. They should distinguish themselves by being plastic to a degree that they may be burnished into the acutest and smallest angle, and yet so far from a fluid that they will not draw away from wall or angle on the removal of the plugger.

They should be of such consistency that they may be burnished into tubule, upon and over enamel rods and margins, and stay there when once in place; a quality suggested by softened modeling compound, devoid of its stickiness. The alloys should be so compounded that when amalgamated, with sufficient mercury, and worked between thumb and finger, there will be a distinct crepitation, creaking, a sibilant tone similar to snow crystals under passing wagon wheels in cold weather.

The strongest amalgams I have tested give off this tone in the most marked degree.

They should "set" readily (partially) when pressed to place and not disturbed. Of the setting I shall speak further, later on.

They should be so compounded and amalgamated that they will "set" readily and reach great density within twenty-four hours.

Months are required in which to acquire the limit of crushing resistance.

Amalgams that have to meet and bear occlusal stress should be so compounded that when set (crystallized) their surfaces should take on a polish like hammered steel, and with sufficient strength so that no human jaw could crush them even under the influence of tetanic spasms.



Fig "d" shows a filling that resisted a dynamometrical pressure of over 950 pounds.

Amalgams for such use should when set have such density that edges may be formed almost as sharp as a knife, and when placed in a cavity have a crushing resistance of 800 to 1,000 pounds.

Fig. "d." When you obtain alloys that will come up to these requirements on amalgamating them they will give no impression to the fingers of creamy smoothness, velvety softness like the feel of the fur of the blind mole, but rather like moist sand if it were more cohesive.

Right here let me say that it passes my comprehension why dentists so commonly desire these creamy, soft amalgams.

A little silver, much tin, an excess of gold, some platinum, with cadmium added, will be when amalgamated, oh, so soft, so delightfully delicate to the touch. Soft putty is not more yielding or easily packed (but putty along the glass of your office windows will become denser and harder). With such amalgam you can fill a baker's dozen of cavities in an hour, get your money; but what of your patient, and of the teeth so plastered up? In a year or two or three your patient will go to some other dentist, as they often come to me to have a tooth or teeth extracted.

If the newly chosen dentist replies "You should not have the tooth extracted, it can be filled and saved," the quick rejoinder will be "I had that tooth filled not long ago, and it did no good. It decayed all the same. It doesn't pay to have filling done. Take it out." Has not that a familiar sound in your ears?

But to return. To bear occlusal stress the alloy should be hard, the grain coarse, and when cast into an ingot should have a clear high pitched ring so that if cast into the form of a bell the tones would be like those used by the "Swiss Bell Ringers."

When poured from the crucible the crystallogenic attraction should be so strong that large crystals should result in the form of

the acute rhombohedron (which I deem the strongest of crystals), of the orthorhombic or trimetric system, and when the ingot is comminuted and the filings amalgamated, the same form of crystallization should result from the movement of the molecules in "setting," as we say.

It would be exceedingly interesting to enter upon the crystallography of amalgams and show why and wherefore, but the length and scope of this paper will not permit. Suffice it for the present when I say, that in the amalgam I have named white alloy No. 2, and which is shown in the fillings herewith exhibited, this form of crystals is apparent under the microscope. Fig. "1" shows one such crystal (a), and others of analagous forms and systems.

This amalgam is the hardest, densest ever tested by myself; and has resistance to crushing force by more than double any other, save my copper amalgam, which latter I do not care further to consider, use, or commend. I have bidden it good-by. I have long held the opinion that when the ideal amalgam was found, it would be composed of those metals for which mercury has an affinity and yet will not be dissolved in it. With the one exception of tin, there is in these amalgams no metal soluble in mercury when compounded.

Tin is only used to give consistency to mercury, an excipient, a highway along which the metallic molecules can go, driven by that force we know so little of, but term crystallogenic attraction.

It is along these lines that I have studied and experimented during the last ten years, and shall continue until the dream may be realized that may be but a dream, when the white alloys I have discovered may be tinted to match the varied hues of the human teeth, so that the nervous strain to operator and patient may be avoided, now incident to placing gold in carious teeth.

But to return from the second digression, amalgams should be preservatives as well as stoppings. So far I think I am safe in saying no metal has been used in dental alloys possessing therapeutic and prophylactic properties except copper.

Perhaps, and I am inclined to think, that zinc carries those properties to a limited extent. So I have argued that copper should be used in all alloys for dental amalgams.

How to use it and not blacken tooth substance, tarnish the alloys nor darken contiguous gold work was the problem.

To the solution of that problem I have bent my energies,

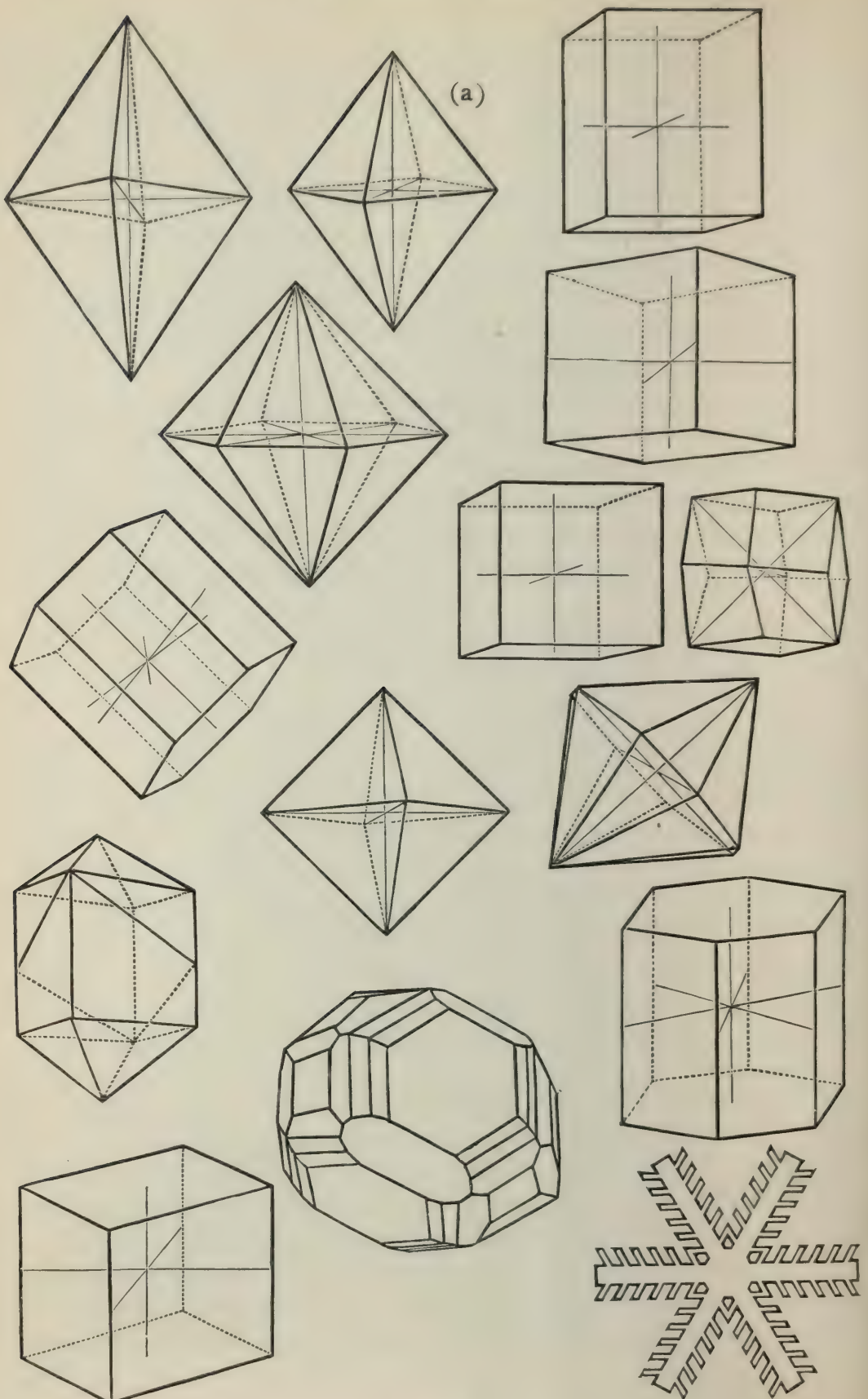


FIGURE 1.

passed many a weary day and sleep disturbed night. How well my labors have been rewarded you may judge when I tell you and ask to be believed, that I have discovered two formulæ for white amalgams, each containing from 8 to 10 per cent of copper, that will not tarnish in the mouth, and which carry the merits described above. Also I have another for an aluminum amalgam which is white and contains the same per cent of copper, and while lacking a little in strength equals the others in durability and beauty for all but occlusal stress. The white alloys and aluminum amalgam having a crushing resistance of more than 400 pounds unsupported by side walls, and in a cavity surrounded, a resistance of over 800 pounds, they are strong enough for any jaw.

This leads me to speak a little further of the requisites of amalgams. You may have noticed that I have used the term in the plural number, I insist that for the proper treatment of carious teeth there should be three formulæ used at least. I use four.

Because of the wonderful strength of these alloys when amalgamated I have named the series "stereon alloys," using the noun form rather than the adjective. It is a Greek word signifying stiff, hard, solid.

One such I have described (white alloy No. 2) one more intensely white for more exposed positions, both of which should be used with all the care that should be employed in gold work, with the exception of the preparation of the cavity, of which I may as well speak here.

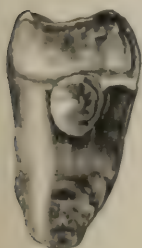


Fig. b.



Fig. d.



Fig. c.

In the use of "white alloy" and aluminum amalgam I pay very little attention to anchorage except that of tubule, enamel rod and margin. Of course if an occlusal surface is presented a broad "seat" is desirable, and in no case objectionable; but there is that quality of cohesion to tooth wall if properly manipulated which is astonishing. If a first and rather a moist layer of either is burnished into the cavity over cervix, border along the enamel margins as well, (Fig. b) and the superimposed layers are well packed, there will

be no "dropping out" of the plug. To show you the nature,

and somewhat the extent of the cohesion I have prepared two specimens, one on the smooth convex side of a toothbrush handle. (Fig. c.)

The amalgam in this was rubbed on covering a square of the handle's surface, and then amalgam added in pyramidal form to the depth of nearly three-eighths of an inch. The other a smooth cup shaped cavity on the side of a tooth old and dry, made by using a round bur about three-sixteenths of an inch in diameter. (Fig. d.)

The cup was not burred out to the depth of quite half the diameter of the drill, so that there was and is not a particle of undercut or perpendicular wall. Into this, amalgam of "white alloy" was burnished and built up precisely as I would fill a cavity in the mouth of a patient to a depth of one and a third of the cup's depth.

To dislodge either or both, I think, will require force that will

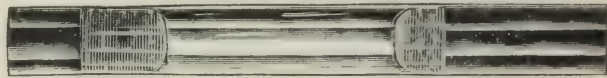


Fig. e.

be a surprise to you. Do not understand me to advise any slighting in the formation of cavities or "seats" and anchorages.

To return from a possible third digression, another and very important characteristic of amalgams is that they should not shrink in hardening, nor yet greatly expand. A slight expansion is far better than a much slighter shrinkage. If the amalgam shrinks at all, in just so far it is defective. A microscopic lessening in the size of a plug may not allow an influx of fluids, and foods, and no harm follow. But better none at all. To this part I have given my best thought and most painstaking experiment. I have been rewarded by a product in which I fail to detect the least shrinkage. To show how severe the tests have been I show you some cylinders and a cube, also a parallelogram of amalgamated "white alloy" cast in steel matrices, the plates of which are only held together by the amalgams themselves. The alloys were amalgamated and pressed into the matrices, precisely as they would be in a tooth in the mouth of a patient in my office. Another test is a glass tube filled with aluminum amalgam at each end against corks pressed down into the tube. Of course no great pressure could be put against the corks. (Fig. e.)

This tube after filling was placed in a bottle filled with black

ink, and remained there since September 8, 1895, and till about January, 1896. It is a severer test than gold could have borne, both for sealing and for color.

Grouping then the qualities that amalgams should possess, the alloys should be of metals that mercury will cling to, and coat over without dissolving in the menstruum. One exception at present seems necessary, tin. I still hope to dispense with it.

The alloys when melted and cast into ingots should be hard, brittle, resonant, dense, and crystallize with uniformity and distinctness without any separation of the metals.

Alloy ingots that can be turned into shavings or planed into spirals or ribbons are not worth either operation.

Amalgams should set readily, and the crystallogenic attraction should be strong, well marked and regular, in the main of the same form and series as the ingot from which the fillings are made.

It should be preservative in its quality as well as being capable of hermetical sealing. Hence, in the present state of our knowledge it should contain copper. It should be a white amalgam that should neither blacken on its surface nor darken tooth structure. It should be so strong that no occlusal force that can be put upon it can cause it to "flow." (See Dr. G. V. Black's treatise in *Dental Cosmos*, May to September numbers, to which I would pay just tribute had I language adequate at my command.)

It should be so plastic as to go readily into tubule, angle and undercut, and adhesive enough to stay there as placed. It should be so dense in structure when crystallized that it will take on a mirror polish, and wear figuratively like hammered steel. Such an alloy and such an amalgam I show you. It is with pleasure that I acknowledge the aid of Dr. E. K. Wedelstaedt, of St. Paul, Minn. Without his help I doubt if I had succeeded. To him I owe the suggestion that led to the use of a hitherto untried metal without which I believe white alloy No. 2 cannot be made. Upon his dynamometer and micrometer attached, the tests spoken of were made. In his keeping are the records of those tests. With such amalgam, in a large class of cavities a filling (to my mind as comely) and better in all respects, can be made than any man can form with gold.

An amalgam possessing the last enumerated essentials *should* be so tinted as to correspond in color with the shade of the tooth filled.

This achievement in coloring I have not made, having only given study and experiment to the sturdier qualities; but I promise you I shall not rest till this, my greatest dream, shall be realized (unless my long rest intervenes) when I believe some one will take up my labor and push it to the accomplishment of all I desire.

And now, Gentlemen, having given you what I deem the requisite qualities of dental amalgams, shall I venture the seeming impertinence of telling you how to use them?

I hesitate, for I know there are those here in many respects capable of teaching me, and at whose feet I would gladly sit as a learner had I the time. Remembering my own failures, not one but many, in my attempts to fill solidly the steel matrices I show you, and make perfect cylinders, perfect cubes and parallelograms, I am encouraged to make some suggestions.

I shall not presume upon your patience by hinting even at the mode of preparing a cavity, except to give my belief that absolute dryness is as imperative a prerequisite for enduring amalgam work as for gold.

I care not by what method desiccation is secured and maintained till the tooth is filled and the amalgam partially set, but it must be secured and maintained.

He who overlooks this step of first importance in amalgam as well as gold work, underrates the force of capillary attraction and persistency of decay where moisture can seep, or he fails in his knowledge of the anatomy of the tooth, or is radically deficient in method and attention to little things, and is not worthy the trust that he accepts.

Of course, there are caries in such positions that no amount of skill and care can bar the oral fluids. These are best treated as emergency cases, with amalgam that contains a large per cent of copper (from 10 to 20 per cent), expecting and promising only limited results, and this without any expectation that tooth and filling will remain uncolored; or if preferable gutta-percha may be used.

But where permanence of repair is possible, lasting ten, twenty or forty years, the "submarine shiftlessness" is inexcusable.

When the cavity is prepared its surface, including cervix and margin, if cavity is compound, should be coated with some balsamic or sticky resin cut in alcohol, coating every particle of surface to be covered in by the amalgam.

Allow a few seconds to pass so that the varnish shall have time to dry, and then with some moist amalgam cover in cervix (if any) margins, enamel rods and all, by burnishing with a smooth "shot" or flat-faced point till tubule and enamel are thoroughly coated as is glass for a mirror, thoroughly grinding in and intimately mixing amalgam with the thin film of varnish. While doing this "poke" out of the cavity all superfluous amalgams, or that which does not adhere to seat, wall or margin. The varnish is more for the purpose of catching hold of the mercurialized metals and holding them in place while the burnishing point is grinding them into tubule, enamel interstice, in angle and along the margins than as a bar to moisture, or for any other purpose. I deem this part very important. How strong the coherence may become is illustrated by the toothbrush and cup cavity spoken of before.

Now and not before adjust matrix if a compound cavity. Wring out from the supersaturated mass of amalgam a portion and break into small pieces and proceed to build up the filling, using burnishing points with a circular motion, and keep the wall portion of the filling the highest. When the first layer is packed in place and burnished down, on no account disturb it, but superimpose another layer, thin enough so that the burnishing shall make the second layer cohere well to the first. In this way build against wall, and in angle until the cavity is "rounding full." The whole mass by this time is solid, and only on the cone surface will there be surplus mercury. This surplus, if any, must be absorbed with tin foil, or better, cubes of crystal gold, well annealed. Then the plug must be burnished down *from center* to and over margins.

The passage of the middle mass of amalgam over the borders will carry any superfluity of mercury and leaves the lines along the margins as dense and dry as is the mass in the center, and no "black ditch" will open to plague you.

Care must be exercised in removing the matrix not to break any part of the mass, and the patient must be cautioned against forceful occlusion of the teeth till it is ascertained that the filling is not too high. But I need not tell you this.

A beautiful finish can be given at the first sitting, as the amalgam sets readily, quite too readily except for expert operators and well trained assistants.

Do not mix the amalgams in a mortar or in the bare palm of the hand; cover the palms with a piece of leather, and use a

spatula instead of the fingers. Why should a neat operator soil hands and fingers, and saturate the amalgam with oil and sweat from the palm, when it is so easy to do better.

I have thus at too great a length spoken freely as I believe ; nothing except from honest convictions, I know such amalgams as I have described are good.

I know the method I have described, if intelligently and faithfully followed, will build monuments for you that will endure until gray hair comes to the young and a long rest to the older ones.

Now I do not wish you to think for a moment that I am asserting that the method given is the best possible one. It is the best one I know now. Others know more than I do and such may work by better lines.

Every man should do his best. Do not think I claim for these alloys, perfected formulæ. Time, the great balance, may weigh them and write "wanting," but I believe them incomparably better than any others obtainable.

I repeat every man should do his best. Think of it for a moment. "Why?" I answer that your patients and mine come to us in trouble, come to us because they trust us as skilled and honorable men.

They take what we give on trust ; pay for what they expect is good. To violate our implied contract, to slight our work, and not give the best that lies in our fingers is worse than theft, worse than robbery, it is an outrage. But I do not believe there is one before me who could be justly thus adjudged.

My faith in you is strong. If perchance I have awakened you to new thoughts on this subject, good will come of it, and I shall experience a keener gratification than your flattering attention has already given me.

NOTE BY THE EDITOR.—This paper was read before the Tri-City Dental Society at Davenport, Iowa, in December, 1895, and before the Chicago Dental Society, February, 1896.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

Regular meeting held January 7, 1896, the First Vice President, Dr. C. E. Bentley, in the chair.

Dr. E. MaWhinney read a paper entitled, "Systemic Medication for Dental Purposes.*"

Dr. A. W. HARLAN opened the discussion. He said: It is quite refreshing to have a paper read to us dealing with principles rather than covering a few isolated cases. I had the pleasure of reading Dr. MaWhinney's paper the other night, and after I read it I came to the conclusion that the one who would open the discussion on it would have to spend a great deal of time to elaborate or discuss the points that were made. Dr. MaWhinney has really covered a larger field than can properly be discussed in an evening. He deals so much with the generalities of the subject that it makes it almost impossible for the ordinary routine dental mind to include in these generalities the class of diseases, abnormal conditions, or lesions, which ordinarily fall to the lot of the dentist to treat. I think that if I had been preparing the paper myself I should have made a somewhat arbitrary list of conditions that we meet with in dental practice, and after generalizing a little I should have pointed out as best I could the proper method of treating those conditions. But Dr. MaWhinney has covered too much.

One of the thoughts that struck me in the list of drugs to be used in dental practice was that he said we must not be copyists. It is almost impossible for a man to practice medicine or dentistry without having to do more or less with things that other people have done before. Before 1700 I believe Dover's powders were used in medicine, and alkaline waters have been used from time immemorial. The people who lived in the fifteenth and sixteenth centuries who were in the habit of eating and drinking too much and not exercising sufficiently, went to the various mineral springs in Europe; and if they were American Indians they went to the sweet or bitter waters that are to be found in this and other countries. So the principle that we must dilute the blood is as old as the hills. The principle of using cannabis indica or hypnotics dates back to a period before the Christian era began. So

* See February Number.

you see we must be copyists in order to meet conditions of pain, in order to change the circulation, and by changing the circulation either depleting the contents of the arteries or veins, we affect the nervous system. If we treat our patient intelligently by restoring the circulation to as nearly a normal condition as possible and giving rest to the overburdened nerves, the part which the doctor spoke of (the condition of the part) will take care of itself. It will take care of itself except in the repair of cavities in teeth and in the production of a new pulp. It will take care of itself as soon as any dead bone has been removed, and if you get the circulation back where it ought to be; if you get the man or woman to adopt correct dietetic habits, as soon as the dead bone is discharged surgically or otherwise, then the parts get well. It is not exactly the province of the dental surgeon to treat all of the constitutional diseases that may be concomitant with the occurrence of certain dental lesions, because he has neither the time nor the inclination to treat such cases fully. That is more a part of the business of the family physician. It is the province of the dentist, who recognizes that certain constitutional dyscrasias are concomitant with, or rather are productive of certain lesions, that they should receive attention at the hands of those who are more familiar with the treatment of such conditions than the dentist can possibly be without he discards the filling of teeth, the making of crowns or bridges, artificial dentures, or correcting irregularities. The point I wish to make is this, that the field of dental surgery is large enough to occupy the best talents and energies, and the whole industry of a man who practices dentistry, and that the great part of the practice of medicine must be relegated to men who devote themselves exclusively to the alleviation of human ills without the use of the knife or the saw, or other implement such as is used by the dentist.

Dr. MaWhinney says that one of the things that must be considered by the dentist, and very justly, is the condition and surroundings of the patient when he comes to us for advice or relief. He has just steered clear of hypnotic suggestion. I am not going to discuss that phase of the subject. The manner of approach of the dentist to his patient is one that should be carefully studied. If you gentlemen who have been only a short time in the city of Chicago, and those of you who have been a longer time and others a very long time, will look over the list of what may be called suc-

cessful dentists, you will find that they approach their patients with the intent of reassuring them the moment they enter, instead of going at them with a pair of forceps with blood on the ends, and saying, "What do you want?" The man who practices dentistry in the city of Chicago or anywhere else, who has clean hands, a clean mouth, clean clothes, and things clean all around him, including windows, towels, etc., and a clean mind, and who really feels that he has been called upon to relieve a person of suffering, always does so in the gentlest manner. From that moment the patient feels, although he does not say so, that he is in the hands of somebody who will do everything possible to relieve him of his suffering, and if the dentist approaches his patient in that way, throwing off everything of another character, such as business perplexities, or anything that may be on his mind, and devote himself exclusively to that individual, if he has the knowledge he will gain the confidence of the patient, and the patient will not be loath to express it a little later. One of the principal factors in taking hold of a patient is to inspire him or her with confidence. When I say this, I am a copyist, because I suppose that that was said by the confreres of Galen and Aesculapius, Hippocrates and other celebrated men of antiquity; but the longer we live and the more we think about things and read about matters outside of the polishing of a crown or rubber plate, or something like that, we broaden our minds.

I wish to say that I am delighted to have an opportunity of discussing a paper on general principles rather than making it a series of pin-points and sticking them into white paper here and there, because I think it is well for the Society from time to time to come right down to the A B C, not the purely elementary A B C, but the A B C of the men who have ability, who have fitted themselves, and have already in a measure become masters of the situation. I made a few notes of Dr. MaWhinney's paper, but I do not think I want to use them. There are a few things in the paper that I would not advise you all to copy directly. He told you not to copy, and he is right about that. You can copy just a little here and there, and with what you have thought out yourself and have gained from others you will be able to build up a system. That is what you must do. I never saw a man yet, nor woman, whose productions I would get up and read and call them my own. That is not the kind of plagiarist I should like to be. What you want,

and what Dr. MaWhinney said in his paper you want, is to think for yourselves. But the men in this room cannot take the whole paper of Dr. MaWhinney and treat all of the conditions with drugs from day to day and practice dentistry too. You can begin, you can point out, you can suggest. But our hours in the day are few. Some of our nights have to be devoted to study, experiment, and recreation, and we cannot be at the beck and call of the public and go from house to house, because we have to get sleep; we have to recuperate; we have to apply some of the principles of the paper to ourselves. We have to keep our own stomachs, bowels, nervous systems, muscles and circulation in good condition in order to do the work which we are called upon to do from day to day.

Dr. MaWhinney spoke of the administration of drugs that would affect the swollen mucous membrane or spongy gums. These are well recognized principles in general and dental medicine. When you have the gums badly swollen and pus is being discharged between the roots of teeth and the periodontal membrane, it is perfectly true that you cannot always cure these cases by administering a little pyrozone, chloride of zinc, or some other local drug. That is evident. That is wherein the paper is sound. Give your man diluents; fill him full with water. Relieve his pain. Wash out his system. I think the essayist said "flush it." That is perfectly correct, and a great many of you would read with profit the work of Dr. S. Baruch on the uses of water. I have talked about water before; I am a thorough believer in water in a great many cases and for a great many purposes. If I could do anything to-night to enforce the general teachings of Dr. MaWhinney's paper, I should feel that I had done myself credit. We do not want to be such profound practicing physicians as he asks us to be, for the reasons I have stated, not because dentistry is too small to include medicine, but I say dentistry is big enough for any man in this room, and that a small part of it is big enough for the most of us. It has to be divided and subdivided, and it will keep on dividing. Twenty years ago I realized the fact that I did not want to make artificial dentures, so I quit. I have never made an artificial denture since, but I am perfectly willing to recommend a man who can do it well. And so I say, you do not want to forget this one thing, that dentistry is big enough for any of you. There are many cases of obscure neuralgias; there are many cases of enlargements about the jaws and the face that many dentists cannot

treat for reasons that will be apparent; but all of these neuralgias and the enlargements that come about through diseases of the teeth or of the peridental membrane, or through some diseased condition of the gums and the bones of the jaws, every dentist ought to be able to find them out. These things should be as A B C to him and he should treat them. It is here that his superior knowledge and skill come in ahead of the general practitioner. Let the general medical practitioner give his potions, powders, douches, intestinal antiseptics, etc., it is not my business to prescribe bisulphate of quinine for a condition of the alimentary tract below the stomach. Patients do not come to me for that, nor to any of you. If you find it is a case of emergency, resort to such treatment. But let Dr. Jones or somebody else do that.

Dr. W. X. SUDDUTH was called upon to participate in the discussion. He said: It is a pleasure to me to respond to this call. I recognize in the paper of Dr. MaWhinney a valuable presentation of the subject of systemic medication for dental purposes. I hardly look upon the subject in the critical light in which my predecessor did as covering too much ground, for surely the paper embodied the principal fact of the preparation of patients for operation and the immediate treatment of conditions which are to be handled dentally. I think every dentist should feel himself at liberty and at home in the use of medication, at least as far as indicated by the essayist. There are one or two points in regard to special medication in which my experience has led me to differ somewhat from the essayist. For instance, in his warm advocacy of trional as a simple and harmless remedy. I have under my care now a gentleman who says that one of the most trying experiences he has had was from the administration of trional. The physician is liable to encounter idiosyncrasies in the administration of almost any drug, and that is why no particular drug is really harmless in all cases. There were two or three points brought out by the essayist that were only touched upon, and one of which I am deeply interested in. One of the first points was that of mental treatment. The great majority of dentists and physicians do not recognize the mind as part of the system, but I was very happy to notice that our essayist did, and if there is any one field that dentists should cultivate next to mechanical ability it is this matter of preparing the mind of the patient for an operation. Dr. Harlan spoke feelingly and to the point regarding the wrong way of ap-

proaching the patient, and I am sorry to say that the great majority of dentists inadvertently, unthinkingly perhaps, meet patients in that way. We are too much given to display of instruments, and we pride ourselves too much in our armamentarium. We have gone wild over electricity, as well as a thousand and one other appliances of that kind, it seems to me, and we exhibit them on all occasions and present their harrowing aspects to our patients and expect them to endure operations quietly and not to complain; that is to say, we present the mechanical aspect of dentistry too much, and instead of administering sedatives, as the doctor indicated in his paper, we administer the opposite. Electricity is an excellent sedative, but it depends upon how you employ it. I use it constantly as a sedative, but I do not apply it with an electric motor. I had an electric motor in my office when in active dental practice at one time, and I gave it to the late Dr. Garretson because he liked such things. I do not like a display of instruments because it brings the mechanical aspect too much to the mind of the patient. Every one of us has an atmosphere, an individuality about ourselves, and that atmosphere is cultivatable. If we meet our patients in an irritable, nervous way, our patients respond in the same manner. If we are driving a horse we know that the horse feels through the lines the temper of our own disposition, and a horse will respond in that same way. A man is an animal in the same sense and responds in the same way. You can develop in your office a sedative atmosphere that will put your patients at ease. I can remember in my early days in dentistry when that point was forced upon me, and when a patient came to my office, grabbed the chair, gripped his teeth with the idea that great pain was to be inflicted, I would go to work and get the patient in a quiet condition before performing the operation. We should get our patients to relax themselves, get their feet, etc., in a comfortable position before we begin operating. If we can put our patients in this quiet attitude, our operations are necessarily not so painful.

Recently there has been published in France a paper which is a reproduction of work done in Russia some two years ago on the subject of effluvia, in which it was demonstrated to the satisfaction of scientific men that every being exudes certain effluvia which helps to make up the atmosphere of the room in which he is or his immediate environment. This has been positively demonstrated,

so that persons who are sensatious in these lines upon being placed in a darkened room and kept there until they became accustomed to the darkness could distinguish the effluvium that passed off from different individuals. As the doctor indicated in regard to chemical research, chemical analyses of excretions of the body have been perfected to such an extent that we can now determine the mental state of the individual during or preceding the time of secretion. We know the secretions of the body are influenced by the state of the mind. You develop a physical effluvia which corresponds to the state of the mind, which is perceived by the patient, and you thus indirectly get control of the patient. It is not necessary to put the patient into the hypnotic state. There is a hypnagogic state in which we are *en rapport* with others, in the waking state, and there is not a successful dentist in this room who practices in touch with his patient but what operates in that hypnagogic state to a greater or less extent. The point relative to the previous administration of sedatives is a good one. It may be however that the administration of sedatives to some patients will act in the opposite direction from what you expect ; it may enhance or exaggerate in the patient's mind the magnitude of the operation. You always want to belittle the operation. Time and again when I have had a nervous patient in my chair I would begin to work around the cavity and not in it and get an admission from the patient that he or she was not being hurt. We should never ask the direct question as to whether it hurts. This subject is a broad one and the discussion can be carried to any extent. Dentists should work up this matter of mental suggestion a great deal more than they have done in the past because it has a sedative influence in the control of the patients, as well as of the pain itself.

The essayist touched upon fear as a causative agent. We are only just beginning to realize the extent to which fear is a causative agent regarding physical conditions. Medical men are coming to appreciate the importance of fear. In the past we have been taught that it was a comparatively trivial condition, but now it is recognized as an etiological factor in the production of diseased conditions. If a patient makes up his mind that he is going to be hurt and his fear is strengthened by the presence of the dentist as he goes into the room, you will hurt that patient sure, and it is almost impossible to operate on him at that sitting. It is better therefore to secure his confidence and get an admission that you

have not hurt him and will not do so. That is one of the essential features of suggestive practice. I never used to allow a patient to go out of my office, if it were possible in any way, but what I would get an admission from him that the experience was better than he expected; that I had not hurt him. These admissions on the part of patients amount to a great deal, and I throw this little point out as a side issue.

The doctor mentioned one other point which is one to which I am giving considerable attention at present, and that is the matter of pain habit. He did not, however, say *pain* habit. I am working on a thesis at the present time on that particular point. A great many neuralgias, a great many chronic conditions of the system are habits. There was at one time no doubt connection with this neuralgic condition, be it what it may, an acute inflammatory condition, a neuritis, that gave rise to pain. That condition passed away but the pain track or the bad habit of the nerve has been continued, and a great many of the chronic neuralgias to which human flesh is heir are matters of habit. The way to get at this is by alterative treatment, and the doctor indicated that to a certain extent, now these different hypnotics, narcotics, and other drugs may be administered to correct or break up the habit, just as you would administer quinine to break up the ague, but not that you would cure the neuralgia in the sense that you would a physical condition. Pain is the perception of an injury. If you will remember that one point you will profit by it in treating your patient. There are many ways of breaking up pain habits when patients come to you. You can do it by medication, by the use of alteratives, or by suggestion, as previously indicated, and it is perfectly within the scope of dental practice, as specialists in medicine, to follow out the line of medication indicated by the essayist in his paper.

Dr. GARRETT NEWKIRK: I regard the paper to which we have listened a most excellent one, and principally for the reason that it sets us thinking for ourselves. It opens up a train of thought which we can pursue with profit. I have not heard for a long time a more thoughtful, broad, comprehensive and lucid contribution. The thoughts it contains were most excellently expressed, and when it shall have been printed in the dental journals it will read well and be worthy of study. It will exercise a wide influence for good. From my own experience and observation, I think there may be a

little danger lurking in it. I have noticed a tendency on the part of a good many dental practitioners to depend too much on medicine for the relief of suffering. If a dentist once gets started in the drug line for the treatment of this and that condition by medication, either systemic or local, he is likely to depend upon medicine instead of treating the condition surgically, in those cases where surgery only can reach the root of the trouble. To illustrate my point I will cite a case which came under my care to-day. A patient came to me and said he had lost two molars by pyorrhœa alveolaris; that the only remaining molar upon the left side, above had suffered somewhat from the same disease. There was extensive absorption of the alveolar walls, especially from the posterior buccal root, so that there was a pocket reaching quite to the end of it, and the man has been for some days having a good deal of neuralgia. Now, the routine medical treatment of that condition would have been to scale and to apply local alteratives or sedatives, or cleansing agents, with quinine and morphia perhaps for their general effect, but I arrived at the conclusion that the disease had extended to the end of one of these roots sufficiently to involve the pulp at that point, and that the pulp as a whole was more or less affected, probably alive in two roots, congested in the body, and that this was the source of his neuralgia. As an experiment, I drilled in to see if I was right. I opened into the pulp, the patient experiencing but little pain. I found a congested condition, and there was an outflow of venous blood, which was followed quickly by relief. Here was a case where treatment by mechanical means was the thing indicated. If we make a mistake in these cases, as we are very liable to, in depending too much upon systemic treatment, we make a failure. We must, if possible, get at the active cause, and if it be a local one, treat it surgically and immediately.

Dr. THOMAS L. GILMER: While I might not agree with all the essayist has said, on the whole I think his paper is an admirable one, and I am anxious to see it in print so that I can read it carefully. It is one of the best contributions we have had for a long time.

Dr. J. N. CROUSE was asked to take part in the discussion. He said: I am in that condition to-night which unfits me for taking part in the discussion of this excellent paper. I am too tired to do anything like justice to the subject. There are too many other questions on my mind, and that is what I believe ails the

dental profession. They have too many unpleasant things on their mind when they go to the chair to operate on a patient. They are not free and easy and comfortable in their thoughts. This disturbed condition of mind can arise from many causes. It can occur from the wickedness of one's mind, but this perhaps is not more common in the dental profession than in any other. A disturbed physical condition unfits any practitioner for doing justice to his patient. A disturbed physical condition unfits a business man from attending to his business properly. It warps his judgment. Many times within the last eight years the most perplexing things have occurred to me that most of you know very little about. Some of them were for the general good of the profession. They perplexed me in a way that I did not sleep. The next morning my judgment on such matters was not worth much. It was warped. I would think along one particular line a little and if it did not look hopeful, I threw it aside. I had the power of throwing perplexing things off my mind, and I believe it is the only reason I am alive to-day. I am able, when in that condition, to quit the whole business. That comes from practice, from long experience. There are probably very few men who have lived as healthy a life as I have with as little recreation. I do not think I exaggerate when I say that I never had two weeks recreation in my life. I have always had to tug. That part of the paper touching upon the matter of how we should approach our patients in the right physical condition is probably the best part of it. I would differ, however, from the essayist with regard to the administration of such a variety of drugs. I am glad we have men in the dental profession who are able to administer these remedies successfully ; but the best physician I have ever known was the one who gave the least number of drugs.

Dr. C. P. PRUYN : The essayist touched upon a very valuable point in the treatment of diseased conditions, and that is flushing the system with water. How many of us are there, leading sedentary lives, who drink anything like the amount of water we should. If we were living active lives, stirring about a good deal, so that there would be evaporation of the bodily surfaces, we would necessarily drink much more water. The system therefore should be charged with large quantities of water and then cast off by the emunctories. I have no doubt that there are a great many dental practitioners suffering from uræmic poisoning simply because the

kidneys are not carrying off the diseased products as they should. There is nothing better than flushing the system with great quantities of water.

A short time since I was called to see a gentleman who was suffering from necrosis of the lower jaw. He was a physician. The necrosis had been going on for a couple of months before I saw him. I found the jaws practically ankylosed in movement, the throat closed so that it was impossible for him to take even liquid nourishment to any extent. Even cold water, if he attempted to take it into his mouth and it came in contact with the fauces, produced spasm of all the muscles used in deglutition. This man's emunctories were not doing their duty. Some days previous to my seeing him he began taking cathartics to move his bowels. He was suffering from an inflammatory condition of the whole digestive tract, as well as from septicæmia and chronic uræmia. The question arose as to what should be done. The first thing to do was to give ether, and even in that condition it would preclude its administration. Of course the kidneys were injured, but it was necessary to choose between two extremes. So we gave him ether, and with considerable difficulty pried open the jaws, removed a large portion of the bone, and the question came up as to what other treatment should be resorted to. Here was a constipated condition. I flushed the system with water. I could not do it by the mouth. The only thing I could get him to drink was a little coffee, but I could not make him drink four or five cups of coffee in that condition because it would injure him. We gave what little water we could with coffee and administered a large quantity of water by the rectum, flushed his system. We fed him by the rectum with beef tea, beef peptonoids, etc., and kept it up for three weeks until we cleared up the system. We used about three quarts of water a day per rectum in order that it would be passed off by the kidneys. It was astonishing how this man's system cleared up. Special attention was paid to bathing, rubbing, and kneading of the abdomen. We gave him a little medicine, but it was very little. The whole treatment was practically hydropathic. He is on the road to recovery. We cannot emphasize the one point of flushing the system with pure water too much.

There are many other points in the paper that might be discussed at great length. I must disagree with the remarks of Dr. Harlan. I think it is our province to so understand diseased con-

ditions that we can intelligently prescribe remedies for them. We cannot always say to a man when he comes to us in a diseased condition, go to Dr. so-and-so for treatment. It is our duty to treat him, and by so doing it is much more satisfactory than to relegate the case to some one else. We take an emergency case and give such remedies as we think are necessary, at the same time we help the whole system, and we must not think that our whole work is confined to the treatment of one particular tooth or to the teeth. That is one of the great and false impressions we are laboring under as a profession. We can see nothing more than the teeth we operate upon and forget or overlook the general systemic condition of the patient.

Dr. T. W. BROPHY: I have but a few words to say. We have listened to a good paper, but I am one of those who believe that it is possible to go too far in the subject of general medication. I hold the view that in the department of dentistry the practitioner should treat the conditions that are within the domain of dentistry. He should be familiar with the application of remedies for the alleviation of pain; he should know how to use them with skill. But when we come to the treatment of the system generally, as has been said by Dr. Harlan, we cannot in justice to ourselves and to our patients take up the entire subject of medicine and manage a patient according to the most advanced knowledge as applied to such cases. For example, neurasthenia is a condition in women not infrequently due to diseases of the genito-urinary organs. No dentist in this room would assume that it is his function to have all of the instruments necessary for making ocular examinations of the diseases of these parts. Gentlemen, it is not possible that anyone can assume that; therefore in neuralgias of the face and of the head, associated with the teeth, the pain is not infrequently due to diseases of the organs peculiar to woman. Therefore we perform our highest duty by referring patients thus diseased to gentlemen who make it a specialty, and who are well equipped and skillful in the management of such cases, and whoever in the practice of dentistry would attempt to treat such diseases would be doing injustice to himself, to his patients, and to his profession. With equal propriety he might take up diseases of the liver with disturbances of the spleen, and say that inasmuch as my patient is suffering from pain about the face, associated with disorders of the spleen or liver, I will treat the entire system. The

field of dentistry including oral diseases and injuries together with the treatment of diseases associated with the teeth is large enough for the most active mind and the most skilled operator, as well as the most industrious student.

Dr. MAWHINNEY (closing the discussion) : This paper is partially a digest of one-half an eight-months' course of lectures delivered to the University senior students ; students who have completed their studies of general materia medica, so that it is not at all surprising that some of my points may not be clear to you, for in order that this paper could be read and discussed in an evening it was necessary to eliminate much that would aid you in understanding it.

I did not intend that this paper should be one on the treatment of the genito-urinary organs. It was on systemic medication for dental purposes.

If a neurasthenic patient comes to me suffering from this disease, and it is not due to any local disturbance within my province to treat, I have sense enough to recommend the patient to go elsewhere for the treatment of the disease. At the same time, I do not want to be in the position of a friend of mine who is a dentist. He had a patient that I had been treating for some time. The patient came to me after being under his care for thirteen years. He developed a local trouble in his mouth, and was being treated, locally only, for this condition. He would get a little better one week, but the next week he was worse than ever. I am very happy to say to you that I was fortunate enough to be able to diagnose that gentleman's case, which was one of congenital syphilis, and I sent him to an eminent specialist of this city, who treated him for his syphilis and he got rid of the local manifestation.

I have had many cases where I have tried to control such disturbances in the mouth, in conjunction with physicians. I have had some physicians tell me they could find no systemic disturbance ; yet, only when I instituted systemic treatment, did rapid recovery follow. It was for the purpose of scientifically understanding these cases that I consented to read this paper.

I am thankful to Dr. Sudduth for coming here to-night and discussing my paper, because he has lead us into a field of thought which is very rich in fruit—and I am so fond of it—mental suggestion. (A case was related in point.)

Dr. Crouse criticised me for mentioning so many drugs. I did

not mention more than a dozen in my paper, although there are over two thousand remedies in use among practitioners in medicine. I am like the late Dr. Allen in this respect, I believe I could practice 150 miles from any drug store. There are times, however, when I use some of the agents I have mentioned this evening, and I get good results from them, and so I recommend them to you.

As far as being copyists are concerned ; Dr. Harlan partly understood me and partly did not. To illustrate ; Frequently I have practitioners come to my lectures, who take out their note books with pencils in hand ready to take notes of the lecture, and after I get through they have not taken a note or scratch of anything. When asked for the reason, they tell me that they thought I would give them formulas to cure this and that condition ; such are the copyists referred to who use only patent nostrums, etc. I say to them, for heaven's sake, gentlemen, I have not time for that kind of work. I want to teach men to think for themselves, to practice for themselves and to combine medicines for themselves or the case in hand.

Regular meeting February 4, 1896, the President, Dr. W. V.-B. Ames, in the chair.

Dr. A. C. HEWETT read a paper entitled, "Amalgams, with Experiments."

Dr. G. V. BLACK opened the discussion. He said : It is exceedingly difficult to discuss such a paper as this. It covers a great deal of ground, and it would be impracticable to undertake to go over any considerable number of the points that have been brought out. There are almost carloads of amalgam being demanded of the dealers, and something is done with it. It is used in filling teeth, and we have heard that these fillings stand, on an average, three years ; that they have black ditches around them in a short time. I do not know that this estimate is a just one, taking the country over. If it is a just one, we have certainly every incentive to improve upon the amalgams in use. If this is a just estimate we need something better, and I for one will gladly welcome any effort in this direction, no matter by whom. I may say, I am not as much in love with amalgam as the essayist. I would not give place to it instead of gold, not by any means, and I see no prospect in the future that I shall. There are several things that

are needed in order to improve our amalgams and the fillings that are made with them, and one of the most important is exactness in our observations. The past has shown well that we are unable to improve them by clinical observation. We must extend our powers of observation farther than the unaided eye can reach, or the observations in the mouth can reach, in order to arrive at greater perfection. The flow of amalgams has been spoken of this evening, but no figures are given as to the size of the blocks used, etc. This is not exactness. In a paper from Dr. Weidelstadt that was handed me, I found no figures as to size of blocks used. I am surprised at that. But there is nothing here that tells me how this compares with the experiments that Dr. Weidelstadt and I have made together. So I really know nothing about it. I wish we had these things more definitely stated. There is a difference between the stress that will crush a block eighty-five thousandths of an inch and the stress that will crush a block of one hundred and eighty-five thousandths of an inch in diameter, and this difference is important when we come to stress and flow. Now, I do not know what would happen, but I suspect thrusts of one hundred pounds, with a point eighty-five hundredths of an inch in diameter, delivered every minute and sustained a quarter of a minute for twenty-four hours would go through one of these fillings. If it should not, I should be very much surprised, if it is a silver amalgam. It would go through the hardest ones I have ever seen, and I have reason to believe that I have seen some as hard as silver amalgams can be made.

Dr. CUSHING: Have you examined these amalgams?

Dr. BLACK: I have not examined these, but I understand they are silver-tin amalgams, that is, silver and tin form the basis of the amalgam. I do not know what the composition is, and this is another point in which we have no exactness, and consequently can base no calculation on that account. I want to speak emphatically of this matter of blacking teeth with amalgam fillings. I want to make this statement: that when the dentine of a tooth is blackened by the amalgam filling it is because of imperfect adaptation to the walls of the cavity, either in the making of the filling, or after shrinkage of the amalgam, and there is nothing that you can put in amalgam that will prevent it. A filling that is perfectly adapted to the walls of the cavity will protect those walls simply by perfectly fitting, and it will not protect them in any other way.

I do not care what you put in it. No antiseptic is going to protect the tooth. You may have an antiseptic that will act for a time, but it gets away. The filling will protect the tooth simply because it is perfectly adapted and excludes everything, and that is all there is to it. And when we get an amalgam that will do that and not waste, we will have an amalgam with which we can do perfect work. Copper amalgams would do it if they would stay, but they waste out. You know how perfectly margins are retained when copper amalgams are put in, but they will wash away. Given an amalgam that will do that, and possibly Dr. Hewett has done it, we have something that will not depend upon chemical influence, but upon stopping the cavity perfectly and keeping moisture out.

Another word as to tests. I was very much surprised when I went to work testing amalgams. I found that I could make a filling in a glass tube, throw it into ink, let it lay for a number of days, and it would show no ink whatever between it and the glass. It looked like something very perfect, and yet when I applied finer test I found that it had shrunk considerably, and I could see with my microscope down the filling and the margin of the cavity. It requires quite a considerable shrinkage to show with the ink test, very much more than we want to have around our fillings I can assure you.

I am glad, however, that this subject is being pushed. Even a push in the wrong direction will help us. Agitation of the subject will help us. It needs a great deal of attention and work, and I am glad Dr. Hewett has offered this paper, because it will set some of you thinking who have not been thinking on this line. It will set some of you to looking for better amalgams and studying the subject of amalgams.

Dr. A. W. HARLAN: The paper that you have just listened to I had never read, although it had been in my possession some time, and I thought it would deal more with the composition of amalgams than with the uses. I do not wish, nor have I any desire to speak on the same branch of the subject that Dr. Black has spoken upon. But I want to say this, that when an amalgam filling is put into a tooth it does not come in contact with ink. That is not the test we want. The test we want is one that will show any change of the amalgam in the tooth at the temperature of the human body, and at the temperature, induced by warmer fluids and substances, and colder fluids and substances that are taken in the

mouth, and will stand those kind of tests. Furthermore, when amalgam is placed in a tooth the essential thing is to have the cavity in the tooth dry, just as dry as you can get it. Another essential thing in the introduction of an amalgam into a cavity in a tooth is that the tooth, after the preparation of the cavity, shall not have introduced into it any substance, vaporizable, chemical, oily, coagulating, or otherwise, because that will interfere with the adaptability of the amalgam to the tooth. One of the things that prevents the adaptation of amalgam to the cavity in a tooth is the film that covers the surface of the amalgam, due to the contact with foreign substance, and the foreign substance is generally the palm of the hand, whether it is clean or otherwise. Now the tests Dr. Hewett has shown, from the standpoint of exactness and fixedness, are lacking in this particular, and I think Dr. Hewett will agree with me in this, that as soon as a tooth is filled with an amalgam experimentally for the purpose of testing its expansion, nonexpansion, or otherwise, the tooth should be immediately immersed in something similar to the mixture that he has mentioned and kept at the temperature of the human body. I can take a perfectly dry tooth, and take almost any amalgam and mix it according to the directions that Dr. Hewett has given, and make the amalgam stick to the plain fractured surface of a tooth, but it won't stick there tight.

I have here two specimens, one of which was made by myself and the other by Dr Wikoff, following the plan of Dr. Hewett, except the one I made was made according to the method I have spoken of, namely, that as soon as the tooth was filled it was immersed in water so as to have it hardened. One specimen I showed Dr. Taggart that I filled and did not immerse in water. Dr. Taggart said to me, "Why don't you put that in fluid!" And I said, "Well, you send around to-morrow and I will show you the specimen." I have not all of the specimens here to-night, but I have one that will serve my purpose. This is a fractured incisor tooth. It is filled according to my understanding of Dr. Hewett's directions for filling a tooth with amalgam; that is, you mix the amalgam very fluid, take a small portion of the amalgam in the fluid state and burnish it against the walls of the cavity, or the surface to which it is to be applied; then you express from the other portion of the alloy or the amalgam that has been mixed as much mercury as it is possible to get out with a pair of pliers (flat nosed)

and through the cloth, and break it up into little pieces, as stated in the paper, and add them from time to time until you have a sufficient quantity, and let it harden. This tooth that I show you was filled in that way, its surfaces ground down, and it was soaked in water at a temperature of eighty degrees and kept that way. Of course, that is eighteen degrees less than the temperature of the human body. It makes a fair comparative test of its adhesive qualities to the surface of the tooth.

I have here a toothbrush handle upon the surface of which Dr. Wikoff placed a filling. It is not polished, but simply filed. This had a filling on it that Dr. Hewett put on, but in working at it Dr. Wikoff dislodged it. I do not know how much force he used, but this he put on and Dr. Black took it off the handle to see how much force it would take to get it off.

Dr. WASSALL: What kind of amalgam did you use?

Dr. HARLAN: Dr. Hewett's amalgam. In order to have specimens stand in the mouth they must be immersed in a fluid resembling saliva, and at a temperature equal to that of the normal temperature of the human body, otherwise the test is not exactly fair.

In conclusion, I would like to say that Dr. Hewett's suggestion that the amalgam should be mixed on a surface that is not capable of embodying moisture and not contaminated with grease or dirt, or that has not been in contact with some unknown gases or substances that would be brought in contact with if it was mixed in the palm of the hand, is a good one.

Dr. C. N. JOHNSON: I am very much interested in the subject. It is one that two or three years ago I thought I knew something about, but I have just reached the point now where I do not feel certain of my position in regard to this question of amalgam. There are a few points, however, in the paper that should be emphasized, and the first one is with regard to the need of reform in the manipulation of amalgams. When we see in everyday practice the character of most amalgam fillings, we cannot but realize that reform is badly needed. There is such a vast amount of amalgam being used at the present time that it is only justice to the community that we should learn to use it to the best advantage.

Another thing mentioned in the paper was the fact that we had been aiming to get a soft, smooth working amalgam. I think the

recent investigations of Dr. Black have proved beyond controversy that the best amalgam is one which feels harsh under the plugger—gritty, full of grain. It is not so pleasant to use as a smooth working amalgam, and this should be especially emphasized to the profession, and the fact noted that anything like a good surface cannot be given these amalgams short of polishing at a subsequent sitting. If the temporary nature of the soft, smooth working amalgams is not recognized the average operator will be disappointed in the use of those amalgams which work with coarse grain under the instrument.

The essayist made a good point when he said that mercury was the cementing substance between the particles of the filings of the amalgam rather than an absorbent of the material itself. I think it has been conclusively proved that the less mercury we have absorbed in the particles of the material the greater will be the strength of the amalgam ; in other words, mercury should be merely a cement between the different particles of the material.

I want to criticise one statement, if I understood the essayist correctly, namely, that he was coming to rely more and more upon amalgam as a saving agent instead of gold. I cannot subscribe to that doctrine in the slightest degree. We are able to accomplish something definite with gold, but with our present light we cannot say the same of amalgam.

I hope this statement of the essayist will not influence the younger members of the profession to take up amalgam and discard gold. I have to use amalgam in my practice, and since I have to use it I want to learn to do so to the best advantage and to find out which is the best amalgam, and to know something about its constituents. But I cannot bring myself to believe that we are going to elevate the profession by encouraging the universal use of amalgam in contradistinction to the use of gold.

Dr. J. G. REID : I want to say a few words in a little different direction from what has been mentioned by the preceding speakers. If I should come into this society with a paper on some agent, the ingredients of which you knew nothing about, and I should tell you that I could fill a tooth painlessly and not tell you what the material was, what would you be likely to say about it ? This is a new thing. We do not know of what it is composed. We know nothing about its composition. None of the ingredients have been mentioned. Do I want to handle anything about which I know

absolutely nothing regarding its composition? I think not. That is the way this thing occurs to me and I do not hesitate to speak about it.

Dr. P. J. KESTER: I did not know that this was dealer's meeting to-night, or I might have brought along samples, testimonials, etc.

I have been working on amalgam for some time, and it seems that I have failed to meet the requisites necessary to make a good amalgam. I have been unable to make an elastic amalgam or one that could be forged into jackknives and that sort of thing, nor have I been able to get an amalgam sufficiently plastic to enter the tubuli; and by the way there has been some question as to just what was contained in the dental tubuli, but when you have filled them with amalgam you *know* what they contain. I have wasted a great many ounces of silver and tin, as well as other ingredients, in endeavoring to find a certain composition which would fairly well meet the requirements of an amalgam filling. I have mixed metals in all sorts of proportions, and after making a great many experiments I thought I had found an amalgam which was all right. From certain tests that have been made, I believe that my formula 65-35 will produce an amalgam that will prove satisfactory. None of the formulæ are secret with me, and I had hoped in a small measure to benefit the profession at large; but it does not seem to me that the dentist himself cares what the composition is. I think, therefore, that the criticism in regard to secret formulæ is a little unjust. I am satisfied that the average dentist cares not what the composition is if the material gives him satisfaction and it works easily.

As to the paper itself, I have no criticisms to offer except possibly the matter of mixing the amalgam on the leather. I see no particular reason why leather will not accumulate microbes and foreign substances just as readily as the hand. You do not wash the leather as often as you do your hands. The criticism in regard to mixing amalgam in the hand, thereby disgusting the patient, is a weak one because it is the same hand that you put in the patient's mouth. That is a part of your business. I can see none of the advantages in using the leather of which Dr. Hewett speaks.

Dr. J. N. CROUSE: I know very little about amalgam. I thought I did at one time, and indirectly did a good deal of injury.

Since then I have been moving slowly. My opinion is that, as a filling material used by the dental profession, it is the poorest thing that has ever been put upon the market or into the mouth of a patient. If by the compounding of metals we could get an amalgam that would not shrink, it would be very desirable. When we mix metals we do not know what we are mixing, unless we get an analytical chemist to assay the mixture and see whether we have the combinations pure or not. Take, for instance, seven specimens of pure silver so called, and you will only find one that is really pure. When you come to lead it is still worse. It is mixed with a lot of zinc, so that it is difficult to separate. Of course, discussion and investigation will bring something out by and by that will be reliable. If you make a gritty amalgam, such as you speak of, put it on the market and send it to a hundred different dentists, the chances are ninety of them will send it back and say it is no good, because it does not work smoothly. If they do not do this, then your experience is different from what mine has been. Really, if we had an amalgam that would save teeth better than gold it would be a sorry day for the profession and the community. I believe the effort that is required in the manipulation of gold and the satisfaction you have of knowing that you are manipulating it, imbues you with enthusiasm in your work, inasmuch as you can see every step and know whether your filling is perfect or not. I do not think I should be as industrious as I am now very long if I could fill teeth with amalgam successfully. I would get lazy; I would pack it in any way, and that is just what a great many operators who use amalgam do to-day. There is uncertainty in using amalgam. I think I have been generally a very radical advocate of gold, for the reason that when I get a tooth filled and make a careful examination, I know I have a perfect filling; and with the advantages of the dam you can keep the cavity dry, finish the filling, examine the whole business and see the condition of your work before you pull off the dam. If some places are not right you can remedy your defects. That practice is more satisfactory to me than filling teeth with amalgam. I had supposed that the manipulation of amalgam with a burnisher was bad. I have been studying for ten years a simple plan whereby I could pack amalgam and not use a steel instrument, and I believe the best packing of it can be done with something other than steel, with an instrument which will exert uniform pressure and if possible press it tightly around

the margins. I had supposed also that after one had thoroughly mixed the amalgam he could squeeze out the surplus. If that is not so, I have been making mistakes in what little I have done. I think, however, the biggest mistake I have made is in using it at all, and it is just as true of crowning roots. There is a class of the community, God's poor as they call them, who cannot pay for crowning, and so plates and porcelain teeth will always be in vogue with them. In bringing something before a society, I should not hesitate to give the ingredients of my preparation.

Dr. T. W. BROPHY: I have listened with a great deal of interest to the paper and discussion. I should have been very glad indeed to have heard from Drs. Stevens and Cushing regarding the history of the use of amalgam, for I think that its use will show that it has come to us largely in waves. Now and then, it would seem to be at high tide as a filling material, and then it would decline and apparently for the time being almost pass out of sight in the estimation of the leading men of the profession. I remember quite well when amalgam was so ill thought of, so lightly regarded, that it was not used at all in the dental colleges for the purpose of teaching students its use. It was absolutely condemned as a material unfit for use in the filling of teeth; and then largely through the influence and works of Dr. Palmer, of Syracuse, and Dr. Chase, of St. Louis, and Dr. Flagg, of Philadelphia, it was revived, and these three gentlemen earnestly advocated its use and declared that they had amalgams that were far superior to any other that had been previously employed as filling materials. So amalgams were again brought into use and again taught in dental colleges. The varieties began to increase in number until something like seventy different brands were put on the market. I remember hearing Dr. Flagg make a statement to that effect. To-day, according to the remarks made by Dr. Black, it is made and sold by the carload, and I have no doubt there are several hundred kinds on the market. When copper amalgam was brought into use it was said to be exactly what had been required. It would not shrink; it would cling to the walls of the cavity; it would exclude moisture and preserve the teeth. So enthusiastic had some practitioners become that they declared it was far superior to gold for a filling material except for one reason, and that was it became very much discolored, and the tooth was darker by its use. Experience has taught us that copper amalgam washes away and

leaves the cavity almost empty in some cases, and according to the statements we have heard to-night it has been condemned as a worthless material for the filling of teeth.

We came here this evening to listen to a paper on amalgam, that seems, so far as observations lead us, to be exactly what we have long desired. We are now passing through an experience precisely the same as that which we passed through in the history of other amalgams, and while the question of the use of amalgam has been discussed, I want to endorse what has been said by Drs. Johnson and Crouse, namely, that it cannot possibly take the place of gold. Some one has said that chemistry cannot produce a material that will not change in the mouth; that will not wear away, that will not dissolve; that there is no such thing according to our present knowledge as an insoluble substance in the way of a cement for a filling material, so we must wait until something can be produced. We must not accept any of these as a permanent filling material.

I cannot agree with the statement of Dr. Hewett as to amalgam possibly taking the place of gold. It is impossible to find any filling material that will stand as gold has stood and preserve the teeth, their color and their integrity as it has done. We have never found it in a combination of the baser metals, and I do not believe that the time will ever come when we can say that amalgam is equally as good a material for the preservation of human teeth as is gold. Amalgam is a material that can be manipulated with a moderate degree of skill as compared with the manipulation of gold, and in my opinion it will be a disastrous day for the dental profession and the public when gold is abandoned for the use of amalgam, and the present high rank dentistry has attained will be relegated to men of very indifferent skill.

Dr. C. F. HARTT: I was very much impressed by the remarks made by Dr. Brophy and thought he might have gone a little further and touched upon the appearance between gold and amalgam in the mouth. You will remember that Solomon, when he covered the roof of the temple, did it with gold and not with amalgam. Appearance is everything.

Dr. G. NEWKIRK: I believe there are a large class of practitioners who can do just as bad work with gold as they can with amalgam.

Dr. NELS NELSON: The subject of the paper which we have

heard to-night has taken a very unfortunate turn in the discussion, and it is particularly unfortunate for the question of amalgams. Amalgam is undoubtedly a filling material that no practitioner can be without. There are places in the mouth where I will defy any of you to be able to put in a gold filling as well as an amalgam filling. The failure of amalgam fillings is in my estimation due to the careless manipulation of the operator. There is no doubt about that. If an operator appreciates his work and exercises as much care when he puts in an amalgam filling as he does when he fills a tooth with gold, I think the results would in general be much better from the use of amalgam. As far as shrinkage of amalgam fillings is concerned, in olden times I have seen amalgam fillings that had been in the mouth forty years and were as good as any gold fillings I ever saw. Amalgam fillings as a rule are handled injudiciously. They either heat it too much, make it too soft or too hard. Copper amalgam is a tender piece of metal, and I think the best results are best obtained when amalgams are made soft enough to put into teeth without squeezing out the mercury, or adding anything to it. The only thing further I would add is this, that it is the careful and skillful manipulation in our work that gives us the results.

Dr. HEWETT (closing the discussion): I would like to spend an hour in a candid, careful going over of the criticisms that have been made, but the hour is late. I only wish to say that I thank the gentleman who have criticised me for their fairness, their gentlemanly treatment, which I have always received at their hands. I appreciate it. When I made the statement that amalgam would take precedence over gold, I believed it. I am sorry to have to believe it, in view of such numerous failures in gold work as all see. I have come to that conclusion against prejudice as bitter as any man in this room holds or has held. I believe I have bought and put into teeth less amalgam than any man in this room. You may go to the dental depots here and you will find that I have bought pounds of gold to ounces of amalgam, and I tried a few years ago when using copper amalgam to find something that would not show black ditch all around the teeth, something that would not be a failure all the time. I did not use it, amalgam, at all, except as a makeshift until I tried copper amalgam. I knew it preserved the teeth. I told Dr. Black so. I can show you copper amalgam fillings in a great many cases that

do not and cannot dissolve away. But, as I said in my paper, I bade it good-by, as I have something better. Here is an amalgam filling in the front of one of those teeth, and here are gold fillings. At a distance of three or four feet you can hardly distinguish the amalgam filling, while you can see the gold fillings clear across the room. I was driven to the conclusion I have arrived at from the appearance of the amalgam in back teeth. I do not use it in the front teeth, nor do I advise it. It is a better filling than I can put in with gold. I can make stronger fillings with the amalgams I hold in my hand than any man here can make with gold. They will bear more occlusive force than any gold filling that any man can put in, and I take Dr. Black's figures in *The Dental Cosmos* to show it. I do not claim that these amalgams are perfect. I have only just begun, but I think I have made a long step in advance. I know it.

Dr. Reid says I ought to give the formula. If I were to give the formula to everybody, ten men in a thousand could not properly melt the ingredients and make the amalgam. There is so much to be learned in connection with the melting of the metals that if the formula were given out the amalgam would be spoiled in making. Does Dr. Reid know the ingredients of any amalgam he has used for the last ten years?

Dr. REID : Yes, I do absolutely.

Dr. HEWETT : Do you make them?

Dr. REID : No, sir.

Dr. HEWETT : Do you know the proportions?

Dr. REID : Yes, sir. I believe the man who tells me the proportions is honest. If you were to tell me the ingredients of your amalgam I would believe you, and I would take the word of any gentleman who says so.

Dr. HEWETT : Dr. Reid is fortunate in having a man who is honest enough to tell him the exact ingredients of the amalgam he uses. I have not put my amalgams on the market, and I do not know that I shall. Probably I shall do so, but if it is unethical for me not to publish the formula and remain as a member of the society, I simply bid you good-by with a great deal of regret, but with not a particle of ill feeling. I have this to say in explanation of withholding the formula that my investigations in making these amalgams have led to a discovery in the melting of metals and treating them in a way that I think will

sometime be of great pecuniary advantage to me, and I cannot afford to give that away. I will say this, however, that if any man in this society will come to me and give me his word of honor that he will not disclose the information I give him to manufacturers, simply make the amalgam for his own use, I will tell him the ingredients. I have had nothing so far that I would hide from any member of the dental profession; I have nothing now that I wish to keep from you. But I think I have a right, if I can make some money out of this, to keep it out of the hands of manufacturers, who would simply flood the market with such a quantity and quality as they are doing to-day.

THE ODONTOGRAPHIC SOCIETY OF CHICAGO.

Meeting of December 9, 1895.

The meeting was called to order at 8 P. M. The President, Dr. D. M. Gallie, in the chair.

The President then announced the subject of the paper to be read by Dr. Peck on the "Preparation of Proximal Cavities in Bicuspids and Molars."*

DISCUSSION.

Dr. C. N. JOHNSON: *Mr. President and Gentlemen:* Something less than a week ago I read a paper before the Chicago Dental Society and Dr. Peck opened the discussion with the remark that I had covered the ground so completely that it left him nothing to say. I return the compliment to him to-night. There are however a very few points in connection with the subject that I want to mention. He said that in almost every case, whenever a cavity occurred upon the proximal surface of the tooth near the contact point, it should be extended to the occlusal surface. I think I should go a little further than even that. I believe that in ninety-nine cases out of one hundred, wherever a cavity occurs upon the proximal surface of a molar or bicuspid, that the cavity should be carried to the occlusal surface. The only exception that I have in mind would be in cases where the proximal cavity occurred upon a surface which faced an open space. If the tooth next to this space had a small cavity occurring at this point (indicating) it might be filled perfectly without extending it to the

* See February Number.

occlusal surface. But the more I see of fillings where teeth come in contact in that way (indicating) and where entrance to the cavity is gained by drilling from the buccal surface the more skeptical I grow as to its utility. It is almost impossible to get access to a cavity of that kind to put in a perfect filling without a very great degree of separation and then when the separation has been gained and a perfect filling put in and those teeth come together, very often the contact point will be immediately upon the line between filling and tooth, thus inviting a recurrence of decay. So I am growing more and more in the habit of opening these cases out to the occlusal surface.

Dr. WOOLLEY: Supposing decay occurs in the center of a bicuspid like this (indicating) and you cut through to the occlusal surface, as you speak of, would you cut with the idea of extension for prevention, that is, cutting around, leaving the margin of enamel free from contact?

Dr. JOHNSON: Yes sir, if it becomes necessary to cut through to the occlusal surface at all, it becomes necessary to extend that cavity as indicated on this model. It may be considered by some an extreme measure, but I tell you, gentlemen, that the practice of dentistry up to the very highest ideals is always seemingly carrying things to the extreme. The moment we extend one of these cavities to the occlusal surface and strike these fissures, we have got to follow them out to their extreme ends. It is a necessary measure if we are going to put that tooth in the best possible condition. The object is not simply to plug up a hole, it is to put that entire tooth in such a condition so that it will be in the best possible state to withstand the force of mastication of food and resist decay. If we are to forget these little holes, and simply operate upon a tooth that comes to us with the idea of making that whole tooth as perfect as we can possibly, we will do better service to our patients.

The statement was made by the essayist that if the cavity be extended under the gum so that when the filling has been completed and finished and the tissue of the gum covers over the margin of the filling, that cavity is safe so far as the margin is concerned, even if the filling was not exactly perfect at that point. There is one thing in this connection, however, that unless the filling is reasonably perfect, the gum tissue will not cover it in a healthy condition. If we leave a ragged margin the gum will not

creep up over the filling normally. It is true what he said that if that margin is perfect and we have the gum tissue covering it in a healthy condition, the margin is safe.

Another statement the essayist made is one which pleases me very much and I have made the same statement a great many times. I think I made it before I heard any one else make it and that is this, that nature does not always give these teeth the best form and that in operating upon a tooth it is our duty to improve the form that nature gave the tooth if we can do it, and we can do it very often. You will see in the literature of the profession the statement frequently made that we must reproduce the form that nature gave the tooth, and a great many men go on and blindly reproduce the exact form, regardless of whether that was the best form for that particular case or not. If we are going to be artists, if we are going to develop our mechanical ingenuity to the highest pitch and do the best service to our patients—I was going to say that we will ignore the form that nature gave the tooth, but we will not go quite so far as that, because nature has given us some beautiful forms; but we will ignore the form for the time being and operate upon it with a view to giving it the best practical form. Even where nature has given the tooth a desirable form originally it is not always the best judgment for the operator to reproduce that form exactly. Suppose the tooth has been built to a sharp angle like this for the masticating surface, it is not good judgment for the operator to reproduce that marginal ridge. When that marginal ridge was built in there, it was built of stronger material than the operator can put in. It is taking too much risk for the operator to build up this marginal ridge. Nature has built a ridge of enamel around here that will withstand any amount of mastication, but in restoring the tooth, it will not be the best judgment to reproduce the marginal ridge in filling material. These fillings should be so formed that in mastication, the cusps from the opposite tooth should force the filling into the cavity, instead of acting as a leverage to draw it out.

Dr. J. N. CROUSE: In regard to cutting through to the occlusal surface, I will describe some proximal cavities which I consider the most difficult to fill and require the greatest amount of judgment, which I should never cut through there, and that class of cases which we are called to operate on in cities especially, where the cavity takes the form close to the margin of the gum of a T-

shape. Here is the main cavity and here is the T-shape, running here, the thickness below the grinding surface may be two-thirds of the tooth very often. In that class of cases you then would advocate, according to this theory, the driving of a drill up to the solid walls of the tooth, up to this T-shape. And then too, as I understood the essayist and the discussion, they are going to straighten this wall here, this wall must be straight at this margin, but here you will have the whitened enamel, right across almost running around the tooth. Now I want to ask the essayist or the gentleman who opened the discussion, whether he would advocate taking his disk or chisel, whichever he has, and cutting all the way up here, the depth of this cavity to where this T-shaped whitened surface is? Just as soon as you go working into that you will find you have struck the most difficult operation, in my opinion, with that long necked tooth. Not the bell crown, but there is a long necked tooth that has that form of cavity coming close to the margin of the gum with this part all perfect. Now I should not cut that up through there, not by any means. Because you will weaken your tooth instead of strengthening it and you will subject your patient to an immense amount of torture that is not necessary. For an easy operation that can be made by a slow process, I would wedge that tooth apart until I could get at that cavity.

Now then again, if I were the patient and with teeth as sensitive as mine, I would give the operator this kind of instruction, stop a little short of making this absolutely straight across here (indicating on model), because I think you can make a perfect filling without it and you can save that much torture to the patient, because when you cut up toward the cervical margin you will come to a place where you will punish your patient frightfully. On this proximal surface I start that cavity with a cylinder or three cylinders of noncohesive gold. It is an old method, but I can fill the cavity in about half the time that any man can do it with cohesive gold all the way through.

I can wedge two bicuspid apart so that I can get plenty of space to get at them and put in the filling, and I will guarantee that it will stand just as long as an operation performed in the other way.

A MEMBER: What do you wedge with?

Dr. CROUSE: That depends on the tooth and how firm it is in the jaw and how much space there is toward the gum, and how old

the patient is, and various things. Sometimes it is necessary with molars to start with a piece of rubber, then after that take pine wood, starting the wedge from the grinding surface and wedge it in. I would a great deal rather do that than to cut the tooth away so much to get at the cavity. The quickest way after all is to go right in. It is not a question whether it is hard work or not. I think the hard work comes in when you do not cut so much to make it perfect, and it may be very well, as teachers, to advocate to the young men extreme cutting, because the failure generally occurs in operations from too little cutting than too much. I will admit that and to a great extreme too. The following out a fissure up to where the defective part absolutely ends is often not done across the molar. That is a very simple thing to do, but the cutting out between two bicuspid can be carried to too great an extreme, and I think it was carried to too great an extreme by the best practitioners of this country twenty years ago, and I have seen failures. It makes a bad break when the patient comes in with a bicuspid split about one-third way up to the gum, hanging so that you can take your finger and pick it off, and you have got your bicuspid standing with a great filling and one cusp on. So there is a mistake to avoid there.

A MEMBER: When you speak of where the decay has extended around the cervical portion each side and not very much toward the occlusal portion, do you put gold in such cavities as a rule?

Dr. CROUSE: Well, I have been a pretty strong gold man and I am more so now, after Dr. Black's investigation. But gutta-percha is a good filling, or used to be. It is not near as good as it used to be twenty years ago, but the old trial plate gutta-percha might be put in there and make the safest filling. Tin might be next, but tin is dissolved by an acid often. Amalgam, according to the most careful investigation, is the poorest filling now in use, if the investigation is correct, of which I have no doubt.

Dr. JOHNSON: In those tin fillings you speak about, you very seldom find caries recurring around them, do you?

Dr. CROUSE: Very seldom. Tin is a great tooth saver, there is no doubt about it. But I would give a great deal for two or three pounds of old gutta-percha trial plate that we had twenty-five years ago.

Dr. REID: I want to bear out Dr. Crouse in what he has been

saying. Now I have covered pretty nearly twenty years of practice already, and the very class of cavities which he is speaking about are the ones that puzzle us most, and I am of the same opinion as he is in reference to cutting through the tooth. I do not believe that we are justified in doing it. Now then, as I refer back to my college experience, and remember our venerable Jonathan Taft, I find some things that he said twenty years ago that stand good to-day. And I know in referring to this class of cavities on the gum, called marginal cavities, they are no more marginal cavities than proximal cavities, because they are between the teeth; it is only a modification of our proximal cavities. And it seems to me that we are doing a very great injustice to cut that tooth away for those cavities that Dr. Crouse has called attention to, and that is what I am particularly talking about at present. Now, Dr. Taft says, in preparing those cavities, of course first you understand we have got to have the space, there is no question about that. There is no trouble about getting space, if you know how to do it you can do it. Then his direction was this, to use a parallel shaped bur and pass in at the angle of the tooth here (indicating) and cut it out and cut up sufficiently high to protect the margin--the occlusal surface. Then you can work the gold in from the side with the proper space and condense it properly, which you can do and which I have done without cutting this part of the tooth away, and make just as good a filling, as Dr. Crouse has said, and preserve the tooth just as well as any man who would go to work and cut all this valuable tooth away and put in a filling in the manner as exemplified by this cavity.

Dr. ROYCE: It seems to me that we have a great deal to say about these cavities without many reasons. I would like to know the reasons for all these things. There are several things which we have to study in order to get good fillings. The first thing is the mechanical possibility, the second thing is to clear our margin of the fluids or the action of the bacteria. If you cut a cervical cavity from the side, and cut down far enough so that your joint between the gold and the enamel comes just above the point of contact, you have got your joint between the gold and the enamel in the weakest part of the tooth, just the place where the bacteria are the most lively, where the food lodges and where it is impossible to keep it clean. If you can cut out the cervical margin and have the margin of your cavity high enough above this point so as

to clear the cavity, then there might be a chance to make just as good a filling as by cutting through. Reasoning it out will tell any man how to cut his cavity to make the best filling for service. Now in regard to cutting the cusps apart, cutting through here. If you get a proximal cavity to fill and leave simply a layer of enamel across here without some good solid dentine, if you leave this enamel without any support and simply fill under it with gold, you have not anything very strong to resist the force of mastication. If that breaks down, of course the filling is gone. I have been accustomed to make a little break across here and run my gold high and cut the opposing cusp so that it will not shut up too close between the cusps.

Dr. JOHNSON: I want to say that Dr. Crouse and Dr. Reid have been confounding two entirely different kinds of cavities and calling them the same kind. This cavity that starts down here along the gum margin is an entirely different decay, a decay that was not under consideration. The decay that starts up here near the contact points (indicating) is the cavity that Dr. Peck was talking about. Another thing, the point made by Dr. Royce is a good one, and even in the cavity starting near the gum margin, unless it is an extreme case, I do not know but I would give my patient less pain by opening up the cavity to the occlusal surface than I would to put a wedge between those teeth and lift them apart.

Dr. CROUSE: I can lift them apart and not have a particle of soreness.

Dr. JOHNSON: In how long a time?

Dr. CROUSE: I will take three or four weeks on it.

Dr. JOHNSON: That is a good point, in taking that long to separate them. But there are emergencies where we have got to perform the operation in less time, and the wedging of teeth is one that the profession needs a great deal of reformation on. They are giving their patients a great deal of unnecessary pain in unlimited wedging.

But here is another point Dr. Crouse made I want to emphasize. He did say something with which I can agree, and that was the danger of cutting too deep into the dentine between the cusps of a bicuspid. I do not believe, however, that the enamel in coming together here has the slightest strength to hold those two cusps together, and the tooth will split with as little force as it will

when there is an opening cut through. In almost every one of these cases, when they are put under the microscope the enamel will be found not coalesced. And then in cases where the enamel does coalesce, it has been demonstrated by experiment that the joining of those two cusps together is weak.

Dr. CROUSE: Take the other proximal surface and let that decay, and then you have got two points standing without any support except the filling between. In that case I should protect that tooth at this point here.

Dr. JOHNSON: There is one thing in that connection, the point I started to make, that wherever we operate on a bicuspid of this kind, and are obliged (as I think we almost always are if we would perform a perfect operation) to cut through this enamel and make a filling of this kind, it is the most important matter to avoid the occlusion of the lower bicuspid, and in every instance where that lower bicuspid strikes in between the cusps of the upper tooth with a sharp cusp it is the duty of the dentist to round that off and make it blunt. It is only a common duty to protect teeth against splitting, and I have seen bicuspid split in that way which might have been saved if the sharp lower cusp had been rounded.

Dr. REID: The cavities that appear on the proximate surfaces near the neck of the tooth occur in teeth that do not decay very readily, and I was going to say that almost the poorest operation that you can make would save the tooth. That is the kind of cavities that puzzle us, and they are sometimes the easiest kind of teeth to preserve, 90 per cent of them.

A MEMBER: I was going to ask Dr. Reid how he would fill that kind of cavity in a molar?

Dr. REID: The same way as in a bicuspid.

A MEMBER: I am speaking of the distal surface on a first or second molar.

Dr. REID: I would find some easy filling, I would not cut that quantity of tooth out and fill it with gold. I would fill it with amalgam, that is how I would do it, and every other sensible man would do the same thing. He would not go to work and spend three or four hours cutting a great sound tooth, to get at this distal surface of a second molar in a little bit of a mouth that you could not get two fingers into, he would not put in a gold filling in that tooth.

Dr. PECK: As is almost invariably the case, the discussion upon the paper to-night, or the discussion to which we have had the pleasure of listening, has been upon subjects not treated by the paper. That is almost invariably the rule in all societies. When we commence discussing the paper, we do not discuss the paper or the subject matter in the paper at all; we branch on to something that is entirely foreign to the subject treated by the paper, and that has been the case to-night. Now you will all remember what I read as the subject of this paper. The Preparation of Proximal Cavities in Bicuspids and Molars. You will also remember that I read these words: "However this may be, the number of cases, the proximal surfaces of which having been wasted away by the carious process to a very considerable extent in which the cavity should not be extended to the occlusal surface is no doubt comparatively very small." Now that is about all that I did say regarding what cavities should be extended to the occlusal surface and what cavities should not be so extended. I did not intend to discuss that subject. That is not the subject of the paper. And you will also remember I read: "But our subject to-night is a forerunner of the fact that we are to confine our dealings to the cavities that must be extended to the occlusal surface."

Now in regard to the treatment of those little narrow cavities along the cervical margins of these teeth. I simply want to say this, that no sane man would take a small narrow cavity running about along the neck of that tooth and extend to the occlusal surface. I would not advocate such methods as that, and Dr. Johnson I am sure would not. So what is the use of talking about that. It is not the subject. And there is absolutely no disagreement between any of us to-night when we confine ourselves to the subject of the paper, and I see no occasion for occupying any more time in the discussion of this subject, for all who have touched upon the subject matter of the paper have virtually agreed to that.

Now another point I want to call your attention to, and that is this: You fixed in your minds not the relative quantity of tissue represented by the two cusps of this tooth in the model and the quantity which is cut away by the extension of the cavity across the occlusal surface. Now take that tooth if you please and contract it gradually, the cavity at the same time is being contracted relatively to the size of a normal, natural tooth, and you will find that the cavity, when we shall have reduced it to the size of a

natural tooth, is exceedingly narrow as compared with the rest of the tooth. So that the wanton waste to get sound tissue by the extension of the cavity as represented by this model, in comparison with that (indicating) is indeed not so great after all. And I want to emphasize one point that was in my mind. Dr. Johnson covered it fully. I simply want to speak of it in order that I will not be accused of going back on my strong ally, regarding the strength that is imparted to the tooth by the union of these two plates of enamel along this sulcus. I presume in 99 cases out of 100 that union between these two plates of enamel at this point is more or less imperfect and in a great many cases, as the doctor has said, where the union seems to be absolutely perfect, yet you place that under a microscope, and you will find that you are mistaken, that the union between the two plates is not perfect at all. In fact, there is absolutely no union between the two plates, hence there cannot possibly be any strength imparted to the tooth because of the proximal form of those two plates of enamel, and cutting through them until your filling rests upon the dentine is certainly not going to weaken the tooth. It cannot weaken it. So if you come to sum the question all up, I can see no reason for any change of method anywhere.

NEW DENTAL SOCIETY.

LOS ANGELES, 1896.

TO THE EDITOR OF THE DENTAL REVIEW:

Dear Sir:—I send you the following history of a new society that was formed in Los Angeles, and hope that you will kindly publish it in the REVIEW.

The Los Angeles Association of Dental Alumni, which was organized February 10, 1895, is probably the only organization of its character in the United States. It differs from similar organizations in this particular point, that its members must be graduates of reputable dental colleges. Owing to this stringent rule the Association has a membership to-day of 24, who are practicing in Los Angeles and Pasadena. The Association holds its meetings on the first Tuesday evening of each month, when papers of interest to the dental profession are read and discussed. The annual meeting was held on January 7 last, when the following officers were elected:

Dr. E. G. Howard, President; Dr. W. C. Smith, of Pasadena, Vice President; Dr. W. A. Smith, Treasurer; Dr. L. E. Ford, Secretary. Board of Directors, Dr. J. D. Moody, Dr. F. H. Sawhill, Dr. B. W. Day.

DR. L. E. FORD, *Secretary.*

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY

EDITOR: A. W. HARLAN, M. D., D. D. S.

ASSOCIATE EDITORS:

THOS. E. WEEKS, D. D. S.

A. E. MOREY, PH. B., D. D. S.

THE FRESHMAN IN A DENTAL COLLEGE.

A few years ago when attendance on one course of lectures was considered enough to fit a man for practice, with his previous practical knowledge gained in a private office, most of the student's time was spent in listening to lectures, dissecting and doing a little work in chemistry and microscopy. Perhaps one-half of each day was devoted to work in the infirmary or mechanical laboratory. All of this only covered a period of four or five months, but this is all changed now. Three terms of six months each in separate years, being the minimum with a prospect of all terms being lengthened to a full nine months course' of three years.

What work must be laid out for a freshman in the altered condition of affairs? Should he be allowed or encouraged to do any work for infirmary patients during his first year, or will it require all his time to do technical work in the field of prosthetic and operative work, along with laboratory exercises in histology and chemistry? Is it possible to permit any practical work on patients during the first year when no didactic or clinical instruction has been laid down in the first year's work? It seems to the writer that it is an injustice to the student to permit him to spend any time in the clinics of the college save as a spectator, and then only rarely. If there are three recitations daily in fundamentals, anatomy, physiology, chemistry and materia medica, with six to nine hours per week each in practical laboratory work in chemistry and

histology, and fifteen hours per week in prosthetic technic, about all of his time will be taken, to say nothing of the study required to keep up with such a course. We think it is a mistake to try to cover too much ground in the freshman year. Six hours daily in exercises and lectures five days in a week ought to be enough for the physical and mental capacity of any student. None of this time, in our judgment, should be spent with or about the patients in the clinics. In medicine the student does not practice in his first year; he may look on, he may visit the clinics when he has the time, but he is not expected to work or assist in the work of handling patients.

It is a mistaken notion to think that everything about a dental school should be practical or practice. A few principles in the A B C of science should be mastered first and it will take all the spare time of the freshman to do this in two terms of six months, especially when it is known that many have only a fair education to begin with, in some cases even we have observed that the student, or pupil has to acquire the art of studying after he enters the dental college. In several of the college announcements before us the statement is made that freshmen students are permitted to operate during the latter part of the regular term. The query is, "are lectures on operative dentistry delivered to freshmen?"

The present inquiry is written to call attention to the injustice of requiring or expecting a freshman to do clinical work in a college infirmary during the first year of his work, but not to prevent his acquiring manual skill in the prosthetic laboratory, as we consider this a part of the proper technical training in the first and second year's work in a dental school.

ANÆSTHESIA.

A recent graduate complains that not enough instruction is afforded by dental colleges in the use of anæsthetics—the practical use of such agents. He wants to operate on sensitive teeth without pain, either by the use of a local anæsthetic or by the inhalation method. Is this a just complaint, or has the painless dentist come to stay, in spite of the injury done in his name. We would like to refer recent graduates, and old ones for that matter, to one thing lacking in most of their work, and that is to their lack of study of a reasonably good work on therapeutics and pharmacol-

ogy. Such a work must be studied every other day or twice a week at least. Every year a new book ought to be purchased and leave the old one go. No local anæsthetic will answer for all cases. We use a dozen or more every week and keep making additions all the time. Read a little, study much and your knowledge will grow.

REVIEWS AND ABSTRACTS.

DENTISTRY A DISTINCT AND INDEPENDENT PROFESSION. A position based upon undeniable historical and current facts, and not upon theories supported by arguments. Read before the Washington City Dental Society at its twenty-ninth annual meeting. Unanimously adopted and ordered to be printed.

From the newspaper reports of the decision of Judge Miller, October 31, in the case of Dr. Burke, charged with violation of the District dental law, there seemed to be a great misapprehension on the part of the counsel for the defense as to the difference in the character and power of colleges and universities, as well as to the standing of dentistry among the learned professions and its relation to the medical profession. This want of information seems to be general among the members of all professions and the people of all classes. The object of the writer of this paper is to supply as well as he can this information, and in doing so he will consider colleges and universities as literary institutions established and intended to instruct students in the various branches of learning required for their chosen professions or callings, and, when they prove themselves properly qualified, to attest their proficiency therein by diplomas or certificates, and when so provided to confer upon them the distinctive degree to which they are entitled.

Judge Miller in his decision referred to the terms of the charter of the National Homœopathic Medical College and said "that under these terms he thought the college could not give a degree in dentistry. The charter mentioned nothing of a chair of dentistry." That is to say, this medical college was chartered, as all medical colleges are, to give a medical education to its students and to confer the degree of doctor of medicine on such of them as are qualified to receive it. So a dental college is chartered to give a dental education and to confer the degree of doctor of dental surgery or its equivalent on its graduates. These and all similar

institutions are limited in their power of certification of qualification of their graduates and cannot properly assume to confer upon them the degree belonging to another profession.

On the other hand a university, as its name implies, is a universal school in which are taught all branches of learning or the four faculties of theology, medicine, law, and the sciences and arts; indeed it is an assembly of colleges, established in any place with professors for instructing students in the sciences and other branches of learning and where degrees are conferred.

There are about six universities in the District of Columbia, some of which have been in operation for a number of years, while others have not yet been fully organized. Three of these have, each of them within a few years past, established in addition to their other departments or colleges, a department or college of dentistry, which has its own faculty, its own curriculum and whose graduates receive the special and distinctive degree of doctor of dental surgery, a degree that is independent of and not connected with any other one. There is a number of universities in the States that have dental departments or colleges, in all which, so far as the writer of this knows, the same state of facts exists.

These facts undoubtedly give to dentistry, so far as the universities are concerned, a position among the learned professions and place it on the same plane as the other learned professions acquired in the universities. •

Prior to the period of their establishment in universities, dental colleges had been chartered by different States and empowered to give instruction and confer degrees in dentistry, the oldest one, the Baltimore College of Dental Surgery, dating back to 1839. This fact and date mark the foundation and beginning of the conversion into a profession of what had before been simply a vocation or calling, or, we may say, the beginning of the birth of a new profession which at this time has all the elements and characteristics necessary to constitute it such. Since that date others have been chartered (some in connection with medical colleges) and now in 1895 there are forty-eight dental colleges in the United States. Thirty-eight of these are pledged, through membership in the National Association of Dental Faculties, to allow no one to matriculate without first giving proof by examination or otherwise of having received at least a good English education, and to exact from every student an attendance on three full courses of lectures

and clinical instruction before examination for graduation. The other ten will doubtless soon follow and give the same pledge, as that step is necessary before they can have a recognized standing as proper dental educational institutions. That this pledge will be kept is assured because any dental college failing to do so will forfeit its standing in the profession.

The members of the dental profession of the United States have been engaged for some years past in the effort to elevate the standard of dental education by improving and unifying the requirements and curriculum of all the dental colleges in the country. As one means to this end two bodies have been formed, the National Association of Dental Faculties and the National Association of Dental Examiners, composed respectively of delegates from dental faculties and from State boards of dental examiners, and meeting annually. They have already done much good and are steadily accomplishing the object of their organization.

The American Medical Association at the meeting in Chicago, adopted June 10, 1887, the following resolution :

"Resolved, that the regular graduates of such dental and oral schools and colleges as require of their students a standard of preliminary or general education and a term of professional study equal to the best class of the medical colleges of this country and embrace in their curriculum all the fundamental branches of medicine, differing chiefly by substituting practical and clinical instruction in dental and oral medicine and surgery, in place of practical and clinical instruction in general medicine and surgery, be recognized as members of the regular profession of medicine and eligible to membership in this association, on the same conditions and subject to the same regulations as other members."

There has been no occasion, so far as the writer of this knows, for the American Medical Association to construe in scope and detail the intention and meaning of this resolution, so that we must be guided in our understanding of it by its language and the circumstances under which it was adopted. It would require too much space to detail the circumstances existing at the time. It will be sufficient to say that there was then a crisis which seemed to call for some such action. The American Medical Association gracefully met the crisis by voluntarily adopting the above liberal resolution.

The resolution conceded that the education acquired in a dental school or college conducted as most of them were at that time and are now, was such as to entitle its graduates to honorary membership in the regular medical profession and to eligibility to active membership in the American Medical Association. That associa-

tion could not confer upon dental graduates the degree of M. D., nor could it authorize them to practice medicine. Its action was then plainly an acknowledgment that the education acquired in certain schools and colleges, other than medical ones, was as much of a professional one as that acquired in medical colleges, and therefore constituted the graduates of such schools and colleges members of a distinct and independent profession, whom by virtue of such education and membership it admitted to honorary membership in the regular medical profession and declared eligible to membership in its organization. This seems to me to be the only proper construction and effect of the resolution, which reflects credit on both professions—the older one for its liberality and the younger one for its attainments. In the same year dentists were, by virtue of the degree they hold from dental colleges, admitted to membership in the International Medical Congress at its meeting in Washington City.

In the District of Columbia practically, and in many of the States by enactment, members of the dental profession are exempted from jury duty, as are those of the medical and legal professions.

Congress and nearly all the State legislatures have enacted dental laws requiring a thorough dental education on the part of any person desiring to commence the practice of dentistry, and have provided for the appointment, in each of their several jurisdictions, of a Board of Dental Examiners, whose duty it is to see that the applicants for license to practice dentistry possess the requisite education, and whose approval and certificate to that effect are necessary before such applicants are allowed to practice.

From this statement of facts, historical and current, it will be seen that dentistry is, by competent authorities, acknowledged and regarded as a profession equal to and independent of all others, and that its qualifications, acquirements and equipments, scientific, artistic and organic, entitle it to the fourth place in the family of the learned professions, the other three being those of Medicine, Law and Theology.

R. FINLEY HUNT, D. D. S.

WASHINGTON, December 19, 1895.

PAMPHLETS RECEIVED.

PSYCHO-PHYSICS OF SLEEP—NATURAL AND INDUCED. By W. Xavier Sudduth, M. A., M. D., Chicago.

MEMORANDA.

Dr. M. A. Bartleson, of Denver, was a recent visitor to Chicago.

Glycerin and tannin will be useful for chapped and bleeding lips.

When is a tooth too frail for a gold filling? When it needs a crown!

Dr. J. M. Revell, of Chicago, a promising young dentist, died recently.

The Mississippi Valley Association will meet April 15 and 16 in Cincinnati.

Sulpho-carbolate of zinc is a good astringent and stimulant, 3 to 10 per cent in water.

Pyoktanin, yellow, is very useful about the excoriated corners of the mouth. Do not allow it to soil the clothing.

Some dentists call it a "plug," others "stopping," and most of us call it "filling." Which sounds the best?

Pure silver suture wire will answer the purpose of holding loosened teeth very rigidly for several weeks during a course of treatment.

Dr. L. N. Shields, of New York, lately of Texas, died of pneumonia in February. Dr. Shields was one of the most promising young men in the metropolis and his death is much regretted.

One of the Chicago dailies said not long ago, that the first lady graduate in dentistry was dead. Lucy Hobbs Taylor was the first woman to graduate from a dental college and she is alive in Lawrence, Kan.

Cinnamon is used in the treatment of cancer with good results. The Ceylon bark is ground up, about one pound, and placed in three pints of water and boiled down to one pint, filtered, and is then used locally or internally in suitable cases.

Powdered acetanalid recently caused the death of a child two and one-half years old by its too rapid absorption through the skin. The child was cyanotic in a few hours. Locally, the drug may be considered unsafe if more than 6 or 7 grains are used on children.

ACUTE CORYZA.

Menthol.....	6 grs.
Boracic acid.....	2 drs.
Subnitrate of bismuth.....	3 ozs.
Pow. benzoin.....	3 ozs.

A good pinch is taken and snuffed five or six times daily.

DENTAL SOCIETY OF SOUTHWESTERN MICHIGAN.

The semi-annual meeting of the Dental Society of Southwestern Michigan will be held at Niles, April 14 and 15, 1896, at Hotel Niles.

An interesting programme has been prepared, and a cordial invitation is extended to the profession in this and other States. E. I. BACKUS, *Secretary*.

Dr. W. J. Younger, of California, entertained at the Richelieu Friday evening, February 21. The following gentlemen were guests. Drs. L. P. Haskell, J. W. Wassall, A. M. Markle, F. E. Cheeseman, W. J. Evans, F. C. Greene, T. W. Brophy, F. H. Gardiner, Geo. W. Whitefield, A. W. Harlan and J. A. Swasey. The menu was excellent, the dinner being served in the crystal room. Many speeches were made during the evening. Dr. Younger has returned to San Francisco after an absence from home of nearly four months.

TOO MUCH COCAINE ON A TOOTH.—IT NEARLY CAUSES THE DEATH OF A RICH YOUNG CHICAGOAN.

R. T. Davidson is a rich young Chicago man who has been touring Southern California. At 2:30 o'clock this morning he was found entirely nude and nearly frozen to death in the open hallway of No. 119 South Spring Street, Los Angeles, California. A doctor happened to room there and discovered him. He got a blanket and wrapped the young fellow in it and carried him to his room, where his clothes were found with \$400 in cash, a number of drafts, and a quantity of valuables. He showed symptoms of cocaine poisoning, and it was with great difficulty his life was saved. He explained he had been suffering from a toothache, and had gone to a dentist, who had treated it with cocaine. He recalled having wandered about for a time, and then gradually lost consciousness in a dream that he was swimming in the ocean.—*Exchange*.

FOUR HUNDRED DOLLARS (\$400) DOLLARS IN PRIZES.

The special attention of our readers is called to the advertisement of the Palisade Manufacturing Co., with the above title on page 7 of this issue.

The prize contest which this well-known firm announces will no doubt attract a great deal of attention, and result in the submission of many articles of merit on "Germicides and Antiseptics in Dentistry." The prizes are extremely liberal, and the well-known professional and literary eminence of Dr. Geo. S. Allan, of New York, who has kindly consented to act as judge, is a sufficient guarantee of the impartiality to be observed in the awarding of the prizes.

We are assured that there is absolutely "no string" attached to the provisions of this contest, and any dentist in good standing in the community is invited to compete on equal terms with every other competitor.

Further particulars as to conditions, etc., can be obtained by addressing the above named firm.

FREEPORT, ILL., Feb. 4, 1896.

EDITOR DENTAL REVIEW:

In the REVIEW of January 15, 1896, I see a review of "The Transactions of the Illinois State Dental Society 1895," by "G. S."

He goes on at some length commending some of the papers for the scientific value they possess and deploring the lack of scientific value in others. He laments the absence of practical papers. G. S. is in part correct but not entirely so. He says Illinois "with its 1500 or more dentists, will have to get her best men to do a little work at home, and not send it all over this broad country of ours." To this I say, amen! That is what the Illinois State Dental Society is trying to accomplish. Every executive committee and every supervisor of clinics actually has to beg the dentists throughout the State to prepare a paper or give a clinic, and

finally come back to the few who are always willing to do their share and yet dislike to come up every year with something or other to offer whether they have felt like doing so or not. Now if "G. S." is a "smart" enough man to review and criticise the Illinois State Dental Society, he certainly must be "smart" enough to prepare a paper and give a clinic of scientific value "to be well worth reading again;" and if G. S. will make himself known, I am sure an invitation will gladly be extended to him. Now if G. S. and all others will individually do the best that within them lies for the State society this year, the work will not be "dormant" but of an "epoch" making character.

Yours truly,

E. H. ALLEN.

RAW MATERIAL FOR FALSE TEETH.—IT IS MOSTLY WALRUS' TUSKS AND LITTLE IVORY.

"Where do false teeth come from?" said a well-known bone importer, echoing a question. "Wouldn't you like to know? Most people, I imagine, think that all false teeth are made from ivory. That is quite a mistaken idea, as the majority of false teeth are now made from anything but ivory. We import large quantities of walrus' tusks for no other purpose than that they may be made into false teeth. You can go into some big dental establishments where teeth are made and you will doubtless find the remains of walrus' tusks lying around, and indeed, a highly polished tooth made from a walrus tusk is just as handsome, although not so lasting, as an ivory one.

"A dentist once came to me for an elephant's tusk, from which a good set of permanent teeth might be made for a wealthy client of his. He was to spare no expense. I found him a tusk, which, being an especially good one, I sold for \$12.50 a pound, the usual price being from \$2.50 to \$3.50 a pound. I afterward learned that the dentist made \$500 out of that set of teeth.

"Of course it would be impossible for dentists to sell teeth as cheaply as they do now if the teeth were all made from elephant's tusks. As a matter of fact, so many people are now wearing false teeth that I doubt if the ivory suitable for this purpose would ever be found. I am told that a good many false teeth are being made from a vegetable ivory, ivorine, etc. If so, the price of teeth must naturally go down, and in time the toothless one will probably be able to replenish his mouth for an absurdly low sum. A set of teeth for \$1.25," continued the dealer, "would create a boom in false teeth."—*Philadelphia Press*.

How is this for a home product!

COCAINE IN CHICAGO.—VICTIMS OF THE DEADLY DRUG ARE NUMEROUS AND ITS USE IS INCREASING.

The *Chicago Tribune* of February 2, 1896, says: A friend of mine here in Chicago had an aching tooth that gave him much trouble. Like many brave men he was exceedingly timid, cowardly if you please, in matters relating to physical pain, and, in consequence, postponed for several days a visit to the dentist. When he finally did go his suffering was exceedingly acute, so that in his desperation he would have welcomed the insertion of a red-hot iron into the quivering quick of the offending member.

His gratification was intense when he was informed by the mouth surgeon that it would not be necessary to extract it, but that he would subject it to treatment and save it to him forever. Not only did he promise this, but, as by magic,

stopped the throbbing of the tooth in an instant of time. My friend departed with a vial of colorless liquid and a small quantity of prepared cotton. The dentist was frank enough to tell him that at intervals of from thirty to sixty minutes it would be necessary for him to pour a small portion of the solution on a limited quantity of the cotton, and place the latter against his gums. This was all; a very simple, easy operation that assured release from pain and a measurable exhilaration of spirits.

My friend, who is somewhat of a student, recalled the ecstasies of the old priests of Isis, the philters of that arch-imposter, Cagliostro, the sublime rhapsodies of the Buddhists, the erotic dreams of Tunisian Moors, and he wondered whether the surgeon-dentist had found the mystical *pharmakos nepenthos*, whose tradition is as ancient as the story of Eden. He found *nepenthe*, solace, excitation, exuberance. Ready was he to swear that the colorless liquid was the veritable *elixir vitæ*, and that perennial youth had covered him as with a garment.

The ailing tooth was cured by the dentist; but my friend found such solace in the liquid that he continued its use unbrokenly. That liquid was cocaine; within three months he was a "fiend." In time he suffered from insomnia, and in order to procure sleep had recourse to morphine. Within a year he had the latter habit as well as the former, and twelve months later died from the direct effects of cocaine poisoning.

LIST OF THEORETICAL QUESTIONS FOR EXAMINATION BY THE ILLINOIS STATE BOARD
OF DENTAL EXAMINERS—ANATOMY.

- I. Give the origin and insertion of muscles used in opening and closing the mouth.
- II. What arteries and nerves will be divided, in making a vertical section of the cranium, on line with the first permanent molar?
- III. Name the bones of the face and their articulation in infancy and old age.
- IV. Describe the sinuses of the head.
- V. Salivary glands and their ducts.
- VI. Development of bone and teeth.

PHYSIOLOGY.

- I. Describe the process of digestion of food from the time it enters the mouth until it leaves the body.
- II. Give the function and constituents of the blood.
- III. The circulation.
- IV. The nervous system.
- V. The lymphatic system.
- VI. The liver.
- VII. The kidney.
- VIII. Respiration.

HISTOLOGY AND EMBRYOLOGY.

- I. Give method of preparing and mounting both hard and soft tissues for histological study.
- II. Describe Meckel's cartilage.
- III. Describe tooth structures.

- IV. *a.* From what layer of tissue is the enamel organ developed ?
- b.* Describe process.
- c.* How is the dental papilla developed and from what tissue ?
- V. Describe the process of calcification in enamel and dentine.
- VI. *a.* How early in the fœtal life does calcification begin ?
- b.* Which tooth tissue first ?
- c.* Give date for all the temporary teeth.
- VII. Describe condition of tooth germs in fœtus at twenty-fifth week of intra-uterine life.
- VIII. *a.* What is the condition of root of tooth at time of eruption ?
- b.* Give date of eruption of deciduous teeth.
- c.* Give date of eruption of the permanent teeth.
- d.* Describe the process by which the temporary teeth are removed.

PATHOLOGY.

- I. Inflammation.
- II. Hyperæsthesia.
- III. Ætiology of caries.
- IV. Diseases of dental pulp.
- V. Predisposing causes of dental caries.
- VI. Pericementitis and alveolar abscess.
- VII. Exostosis.
- VIII. Necrosis.
- IX. Secondary dentine and pulp globules.
- X. Dental calculi.
- XI. Pyorrhœa alveolaris.
- XII. Pus.
- XIII. Aphthous stomatitis.
- XIV. Erosion.
- XV. Dental anomalies.
- XVI. Diseases of the maxillary sinus.
- XVII. Ostitis and osteomyelitis.
- XVIII. Tetanus and trismus.

OPERATIVE DENTISTRY.

- I. The interproximate space; its importance and how it shall be preserved.
- II. Preparation of typical proximate cavities in molars, bicuspid and incisors.
- III. Treatment of enamel margins prior to filling.
- IV. *a.* Filling material.
- b.* Mallets and malleting.
- V. Filling teeth with gold, with tin, with amalgam.
- VI. Contour fillings in anterior teeth.
- VII. The matrix.
- VIII. Capping pulps.
- IX. Destroying pulps and filling roots.

MATERIA MEDICA.

- I. Describe five astringents.
- II. Describe five narcotics.
- III. Describe five escharotics.
- IV. Describe five anæsthetics.
- V. Describe five counterirritants.
- VI. Describe five essential oils.
- VII. Describe five antizymotics.

THERAPEUTICS.

- I. Prophylaxis.
- II. Electro-therapeutics of the dental pulps and peridontium.
- III. Therapeutics of inflammation.
- IV. Therapeutics of abscesses with fistulous openings and blind abscesses.
- V. Therapeutics of acute and chronic pulpitis.
- VI. Therapeutics of pyorrhœa alveolaris.
- VII. Therapeutics of gingivitis.
- VIII. Therapeutics of dental caries.
- IX. Therapeutics of osteomyelitis.
- X. Therapeutics of hæmorrhage in subjects of hæmorrhagic diathesis.
- XI. Therapeutics of stomatitis.
- XII. Therapeutics of facial neuralgia.
- XIII. Therapeutics of sedatives, hypnotics and narcotics.

TOXICOLOGY.

- I. Arsenical poisoning and antidotes.
- II. Poisoning by iodine and antidotes.
- III. Poisoning by mercury and antidotes.
- IV. Poisoning by carbolic acid and antidotes.
- V. Poisoning by anæsthetics and antidotes.
- VI. Poisoning by narcotics and antidotes.
- VII. Poisoning by cocaine and antidotes.
- VIII. Poisoning by aconite and antidotes.
- IX. Poisoning by unknown drugs.
- X. Poisoning by infection.

CHEMISTRY AND METALLURGY.

- I. Give process of analyzing saliva.
- II. Chemistry of tooth structures.
- III. Give method of testing for iodine, mercury, phosphorus, antimony, arsenic and lead.
- IV. *a.* What is a metal?
b. Describe five metals and their uses in dentistry.
- V. *a.* What is the order of metals used in dentistry as heat conductors, taking silver as a standard of 100?
b. As to their power to conduct electricity?
c. As to their malleability?
- VI. *a.* What is the nature of an alloy, and of what may it be composed?
b. What effect has alloying upon the color, malleability and tenacity?

VII. Composition of gold coin, silver coin, brass, German silver, type metal and Babbitt metal.

VIII. *a.* Formula of soft solder, silver solder, 18-20 karat gold solder, platina solder and fluxes used.

b. How are base metals added to gold and silver in making solders and amalgams?

IX. *a.* Desirable qualities of a dental amalgam.

b. Reasons for its discoloration.

c. Influence of tin, silver, gold, platinum and copper on amalgam.

d. Formula of a good dental amalgam.

e. Symbols, atomic weights and fusing points of platinum, gold, silver, aluminum, zinc and tin.

TWO CASES IN PRACTICE.

Patient, male, about thirty-five years old, presented himself with a badly set fracture of the mandibula, sustained in a collision with a telegraph post after a rather sudden exit from a buggy (case looked like Fig. 1.) The inferior central incisor was gone and the left incisor lateral inferior incisor had been moved interiorly

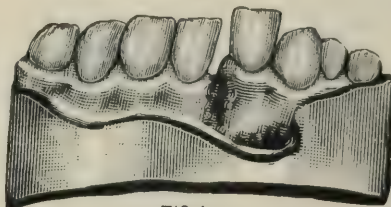


FIG. 1.

about one-fourth inch, the cicatrix was not quite healed and some pus discharged from the cicatrix as well as the labia inferioris. As soon as I saw the case I was satisfied that Dr. Jackson's regulating appliance would be the proper thing for the

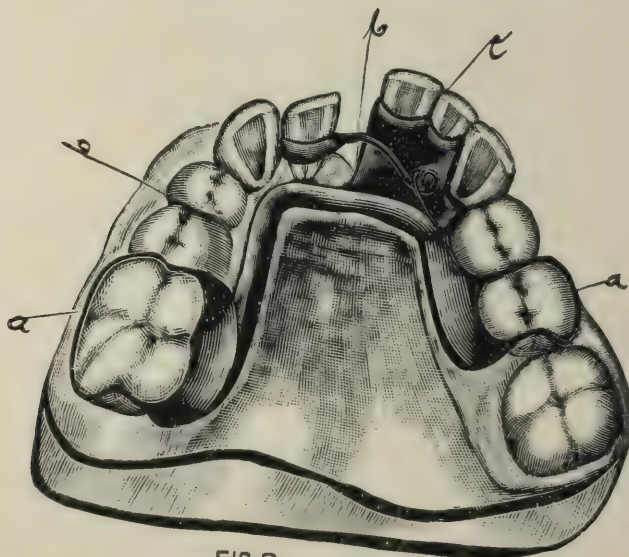


FIG. 2.

case, and a contrivance similar to the one shown in Fig. 2 was constructed. Two clamps of tempered nickel wire (gauge 24) were fitted over the first left molar and the right second bicuspid (Fig a). They were connected by a nickel wire (gauge 18) as a base (Fig c), a small platina plate fitted to the lingual surfaces of the right

inferior incisor (as shown in c) to hold these in place, as they were loose. After this the clamps, base, the backings under the clamps on the lingual side of the two incisors were soldered together in their proper place on the casts with pure tin, adjusted in the mouth and two piano wire springs soldered on this as shown in Fig. b. These were bent a trifle every day and within less than a month

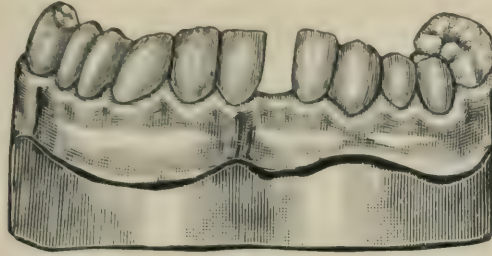


FIG. 3.

the case looked like Fig. 3. A tooth was then inserted on gold wire clamps like shown in Fig. 4, which does good service, and has the advantage that the patient can remove it and cleanse the prosthesis as well as his teeth besides showing as lit-

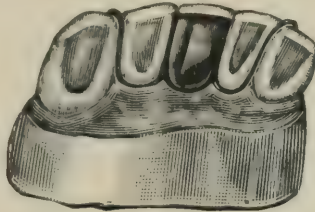


FIG. 4.

tle of the gold as it is possible in any prosthesis when in situ. I am indebted for the idea to Dr. V. Jackson, of New York, upon whom I called on my trip to Europe last summer. Dr. Jackson was kind enough to explain his methods to me in extenso, while Dr. Messerschmidt, his assistant, demonstrated the *modus operandi* of construction to me. It may take some time before all the possibilities of Dr. Jackson's methods are grasped by a practitioner who did not have the above advantages, but anybody who familiarizes himself with Dr. Jackson's methods will find them the *sine qua non* in the most cases, in which a regulating appliance is needed.

A patient, male, thirty years old, presented himself with a parulis extending from the orbital to the submaxillary regions and a large tumor covering the proc. palat. of the size of a small egg. Anamnesis and diagnosis showed a chronic case of pericementitis of the left radix incis. lat. super. aggravated by cases of chronic pericementitis and alveolar abscess on other radices, periostitis of the lining membrane of the proc. alveolaris and palat. max. super., sanious pus indicating necrosis of the hard tissues. The radices were extracted and a fistula found connecting the alveolus of the rad. incis. lat. super. with the large tumor on the superficies palat.; the fistula was too small for the discharge of the vast mass of pus in the tumor and an incision made about an inch and a half long on the palatinal surface for a free discharge of the pus. After cleansing the tumor, etc., first with aseptic tepid water and then with hydr. dioxide, tampons were inserted in the alveolus as well as in the opened tumor to prevent healing of the surface *per primam intentionem*, and the patient admonished to call next day. The patient is a potator and celebrated his

release from pain in his usual fashion, and as he had no pain, removed the tampons himself next day, whereupon the incision and alveolus healed per primam in the first few days, leaving only a small fistula near the left cuspis super., which discharged pus continually, in spite of which the tumor on the superficies palatine kept on increasing and when the patient came back within about a week the inflammation extended from the margo alveolaris to the palatum molle, including the uvula, and the tumor was so large that it made mastication and deglutition nearly impossible. As the tumor on the anterior surface of the maxillary had entirely subsided I concluded that as the radices were removed, necrosis of the maxillary had set in. The pus was evacuated through a liberal incision made on the palatine surface and the wound tamponed again after syringing with hydrog. diox. A thorough examination on the next day revealed a sequester about three-fourths of an inch long and one-half an inch thick, which was removed. The same treatment continued and the edges of the bone scraped. I thought that granulation did not set in fast enough and used a 10 per cent solution of ac. sulph. aromatic. as a disinfectant and antisepticum which seemed to accelerate the granulation and the case is nearly well now. I believe in such cases, as above the ac. sulph. aromatic. is preferable to hydr. diox.

Fritz W. Huxmann, D. D. S.

OBITUARY.

WILLIAM HENRY DWINELLE, A. M., M. D., D. D. S..

William Henry Dwinelle born in Cazenovia, N. Y., July 22, 1819 died of progressive brain trouble at the homestead, Cazenovia, February 13, 1896, where for several years he had been living in retirement. First studied with Dr. Douglas, of Albany, N. Y. With Dr. Chapin A. Harris was instrumental in establishing the first dental college in the world; also associate editor of first dental journal ever published. Of marked mechanical genius, made his own instruments as needed, before such were in general use. Also invented many things now used in dentistry. Never patented anything, considering it as he once said at a scientific meeting, "illiberal and degrading to traffic in what should be free to all."

Omniverous reader, amateur of fine arts, books and pictures were his chief delight; at one time owned a library and art collection of value.

Always ready to recognize merit in others—witness his able defense of Morton's claims to priority in the discovery of the application of ether to general anæsthesia in surgery, published in 1849 at a time when the medical profession were divided in opinion and much doubt and bitter discussion prevailed. To struggling students, artists, writers, etc., he gave kind encouragement and pecuniary aid, as well as to institutions of art and learning.

Memorable dinner given by the medical profession in 1888, to celebrate his half century of active practice.

Treatise on crystal gold appeared in 1855, preceded and followed by other important monographs.

For many years member of the Union League Club, the Historical Society, National Academy of Design, Jockey Club, St. Nicholas Society, County Medical Society and New York Odontological Society, of which he was at one time president.

Forty years ago performed operations on the jaw for removal and resection, similar to those that are the pride and glory of modern surgeons.

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ORIGINAL COMMUNICATIONS.

TO WHAT EXTENT IS INTERNAL MEDICATION A NECESSITY IN THE PRACTICE OF DENTISTRY.*

BY C. E. BENTLEY, D. D. S., CHICAGO, ILL.

The position I occupy upon the program is unique. Two months ago an able paper was presented to this society, upon the same subject, to which I was an interested listener. The excuse for this paper is that it takes ground not spoken of in the paper or discussion, and presages a revolution in the condition of things pertaining to the subject. I have therefore the advantage of, viewing my remains beforehand, knowing full well the fate of him who antagonizes the accepted condition of things on any given subject.

If I understand the drift of the straws in the dental wind, it is toward a growing disposition to a larger application of drugs internally, ranging from prescriptions for fear to the development of defective osseous structure, and to give what I may call undue credit to systemic medication in the treatment of the various pathological conditions for which we are specially consulted.

As to any agent, mechanical or medicinal, which can give us aid in the practice of our profession, I unhesitatingly say, "use it." But, with my present convictions, together with what I glean from medical literature as to its tendencies, I cannot find the warrant for those in our profession who may be unduly enthusiastic as to the benefits they derive from internal medication. The use of drugs by the medical profession must be the basis of our reckoning; their teachings must of necessity largely modify our conclusions.

*Read before the Chicago Dental Society.

It is not a figment of the imagination when it is said that the tendency of the medical profession to give drugs is on the decrease, while the tendency of the dental profession in the same direction is on the increase. To fully comprehend my position upon the subject, and do justice to the principal corollary upon which the conclusions rest, it is asked that you look at the kaleidoscopic panorama medicine has presented: out of the heterogeneous mass what a homogeneous creation has come! What is the status of therapeutics? If the literature of medicine to-day indicates one thing above another, it is that enthusiasm in therapeutics is unwarranted. The shores of medicine are strewn with the remains of outlived and unfulfilled hopes, of explosions of the most plausible theories, of overthrown remedies, once the sheet-anchor in many serious diseases. I need but call from the shadows of the past the specter of venesection. Though hoary with age, it drooped its head and died, when the light of modern physiology and pathology shed its benignant rays into hitherto impenetrable depths. Opium, once the sheet-anchor in certain forms of peritonitis and many other serious diseases, to-day occupies the simple position of anodyne, and so on and on with the rise and fall of the thousand and one drugs which have at one time or another pressed for recognition. Let him who grows fulsome in his laudations of a remedy bear in mind how these mighty giants fell, and endeavor to rescue the remedy he espouses from a similar fate by judicious tests and comparisons. It is no task to get the intelligent physician to-day to confess that the *materia medica* consists chiefly of medicinal agents, whose action on the human body, with few exceptions, is uncertain, and whose effect upon disease is neutral or unreliable. That high priest of advanced therapeutics, Simon Baruch, in 1893, before the New York Medical Society, made the startling statement, that with the exception of quinine, salycilic acid, mercury and the iodides, there is not a single medicinal agent which may be regarded as actually curative. This phillipic was substantiated by Drs. Alfred L. Loomis, A. Jacobi (two eminent authorities in clinical medicine in the city of New York) and Osler, of Philadelphia.

There are two branches springing from the same medical tree to-day; one is stalwart, lusty and vigorous, the other is waning, jaded and decrepit. The former is rational, the latter empirical medicine. Psycho-therapeutics, bacteriology, biology, modern path-

ology, physiology, and the microscope, are the handmaids of rational medicine. The *ipse dixit*, the master of empirical medicine ; the one gives aid to the *vis medicatrix naturæ*, the other deals largely with symptoms, regardless of cause.

Another setback to therapeutic enthusiasts is the idea enunciated thirty-five years ago by Prof. Virchow, upon cellular pathology. Recent experiments have proven the soundness of that speculative hypothesis, and the progressive physician is casting aside another case of drugs and directing his thought to the cell. This class of men claims that the true therapeutic value of a drug is by no means to be measured by the mechanical effects produced, but that the rational treatment of disease should be based upon a knowledge of the effects which medicinal substances produce upon the functions of the cell, and since the cells in different portions of the human economy have special functions to perform, and therefore vary in their structure, it follows that no one remedy is likely to affect all cells in precisely the same manner. It must be evident, therefore, that the rational treatment of disease should be based upon the therapeutics of the cell. The remarkably favorable results attending the use of cold baths alone in typhoid fever furnish evidence that the economy, unaided by medicines, can withstand and finally eliminate the poison of this disease. Indeed, if the statistics are to be relied upon, the large mortality in this disease treated by the routine method, as contrasted with the low percentage of fatalities with the bath treatment, forced one to the conclusion that medication has been responsible for more deaths than recoveries.

Cellular therapy is concerned in producing leucocytosis, a condition by which these cells are increased, which, when the body is diseased, take on a phagocytic action and destroy an enemy upon mischief bent. This condition is produced without medicine.

Treating symptoms and treating the causes which produce them are vastly different. A physician, in relating his experience when *veratrum viride* was first introduced, at the time when a rapid pulse was the chief manifestation of all fevers, stated his observations in a case of pneumonia, when the drug was given until the pulse was reduced from 140 to 80, and yet consolidation continued to the bitter end, and the patient succumbed with a normal pulse. History repeats itself in the application of the coal-tar antipyretics recently so much in vogue. Therapeutics would be a

simple art in this day of patent medicinal agents, could its aims be merely filled by meeting certain symptoms.

Vis medicatrix naturæ has been an old cry with the medical profession, but few have had the courage to loyally adhere to it. At one time a complete therapeutic nihilism, emanating from the Vienna School, threatened to become its expression; but when the chemist evolved those patent sledge hammers which could beat down symptoms the gentle handmaiden, nature, was set aside, and the patient was beaten down with the symptoms. It must be patent to the most enthusiastic polypharmacist that he accomplishes only an amelioration or removal of certain manifestations of disease, a result which probably does facilitate restoration to health, but rarely, if ever, the direct means to such restoration.

The application of those agents which are potent in maintaining the system in health, viz., rest, exercise, diet, baths, change of environment, I believe to be more powerful in their curative results than the most intelligent application of medicinal agents.

Thus far I have predicated upon the tendency toward the use of drugs by the medical profession to apply the conclusions to the dental profession; for it must be evident that the rationale of our treatment must be in consonance with the best teachings and thoughts of those who make this a life work. If, then, I have shown that the confidence in drugs to cure disease, barring the exceptions named, is on the wane with the medical profession, what am I to conclude regarding the internal use of drugs with our profession? If I have shown that the rock upon which therapeutics has always split is the treatment of symptoms, how much more forcibly must it apply to us? Is it not the truth that every pathological condition we meet with in the mouth throughout the whole realm of dentistry is either due to local causes or a local manifestation of some remote cause? From the teething of the infant to the impacted third molar, from stomatitis to carcinoma, is this not the fact?

If we concede that most of the conditions we treat are dependent upon local causes, what would be the value of systemic treatment for a condition which can the more readily be eradicated with local measures? If it be a local manifestation of a remote cause it is, it seems to me, our province to administer to the relief of the local conditions and refer our patient to the one whose specialty it is to deal with such causes. The knowledge to enable

us to detect such causes should be and is fast becoming a part of our armamentarium, but the skill to treat for such causes belongs to that class who make it their hourly business, their life work. I must confess I have but little confidence in systemic treatment for the relief of pain incident to dental operations. I go further, and say I never expect any drug to be given internally whose potency is such that after permeating the tissues it will finally enter those tubuli and so hypnotize the stuff therein as to enable one to cut across them with a bur without giving pain.

As to neuralgic conditions. The neuralgic conditions with which we have to deal are due to local causes, and I need not rehearse them here. Suffice it to say that all neuralgias due to diseased dental organs disappear like magic as soon as the cause is detected and removed. In persistent neuralgias due to faulty nutrition, neurologists are not agreed whether the seat of manifestation be in the ganglion or in the nerve track. They do know that all conditions which promote digestion and assimilation independent of drugs, cause these neuralgias to disappear.

In that most obstinate of all diseases with which we have to contend, pyorrhœa alveolaris, Dr. Younger has demonstrated the same cardinal principle; remove the cause—by local means—chemically or mechanically, keep the parts clean, and with a suitable mouth wash the case gets well. The various phases of stomatitis, unless due to syphilis or mercurial poisoning, are similarly treated, with the same results. I should rather rely upon mechanical irritation for the diversion of the blood current which would terminate in pus, than upon the drugs which have the reputation for pus prevention.

In my opinion, hyperæmic or inflammatory conditions of the pulp are the more easily and permanently allayed by mechanical means at our control than by the doubtful method of systemic medication.

In short, without further reference to the conditions with which we have to deal as dentists, any pathological condition dependent therefor upon an irritant, that irritant is the more quickly removed and the effects the more easily dissipated when that removal is mechanically made. This is fast becoming a law in the medical world. When it cannot be literally applied it is approximated. The flushing of the system with water is mechanically stimulating the emunctories of the body. The flushing of the

colons for removal of impacted feces and auto-infective material is literally mechanical. The use of the cold bath in typhoid-pneumonia, phthisis, etc., is mechanically shocking the nerve centers, and inducing thereby nerve resistance and toxic elimination of the poison producing the disease. The scrubbing the stomach with sponge and holder is to literally remove the undigested products and stimulate a healthy action of the peptic glands. Massage, with all its applications, is passive exercise for organs brought into bad report from too infrequent use. The various therapeutic uses to which electricity is put in medicine are the mechanical principle practically applied. Surgery occupies its exalted position by reason of its mechanical application. Thus we note the tendency in the medical, and it must be all the more so with the dental profession.

But there is another side. I have been dealing with the physical; there is a psychical side also. Tennyson somewhere puts into verse the saying that the mind contributes as much to the body as the body does to the mind. Many ills may exist in the body, the perception of which having been associated with the mind so long as to cause an individual to really imagine that the ill does exist when it does not. Numerous cases are upon record to prove this statement. Psychologists tell us that pain is not a condition per se, but the perception of an injury, mental or physical. As a consequence we have a school of more or less earnest workers who believe all ailments of the body can be removed by appealing to the mind. This I believe to be only a half truth. While I believe some ailments can be thus removed, I do not believe any amount of psychico-suggestion can remove a bullet from a man's body. Thus we have to consider the other half, or the physical, to get the whole truth. But that we will yet secure from the large number of serious workers in psychological laboratories an effective means for the control of patients and pain, I firmly believe. I hail with joy and gladness this new thought in all its implication, as the dawning of a new light, the application of which is beyond our comprehension.

In conclusion, let me not be understood as being arrayed against medicine as a valuable adjunct in many crises and perilous moments, as a potent aid in helping Nature readjust herself. I do believe, however, that our use of medicine should be decidedly limited, when symptoms are the chief manifestations.

What I have said will doubtless raise a storm of objection about my head, but I dare say it, because they are my convictions. For it is a good thing to have a fair mind open to conviction; it is not a good thing to avoid convictions, so as to preserve a fair mind. I shall hold my mind open to future conviction. The fiction of yesterday is the truth of to-day, and the truth of to-day may become the folly of to-morrow.

THE ARTISTIC IN CROWN AND BRIDGE WORK.*

BY L. A. EDWARDS, D. D. S., CHICAGO, ILL.

The subject of crown and bridge work is old and has been worn threadbare. Time and time again the most able men in the dental profession have written, talked, argued and disputed on the theme, and hardly any two agree upon all points in regard to the manner of construction, durability, cleanliness and usefulness of crowns and bridges. In face of all that has been written and said on the subject, each man has his own ideas and his own mode of construction. He is set in his way, and no other way is good, or if there is any good in some one else's way, it is inferior to his own, and he will defend his ideas with words, and almost with blows if necessary. Why is it that when we get into a certain way or rut of doing things, and have from fair to perfect success in our work, done in our usual way, that we become egotistical, and imagine that no one else can do as well, that our way is the only way the thing can be done, and that he who does just as good and perfect work, only by a little different method, does not know much, and is no good at all. Did old Mother Nature cast us all in the same mold? Or did she give us all a mind broad enough to see the good in others? Have we degenerated into men of a single idea? Yet there are many men in our profession with minds as broad and capable as any in the world. Of these I ask forbearance as I try to present an old subject under a little different title, "The Artistic in Crown and Bridge Work."

A piece of work to be artistic must be perfect in all respects, judged not only from a mechanical standpoint, but from the effects produced upon the eye of an observer. A crown or piece of bridge work may be perfect mechanically, but still be very far from

*Read before the Odontographic Society of Chicago.

artistic. How many crowns do we see that could be made perfect by a slight change in the position of the facing, either by throwing the neck or cusp out or in a little, or by changing the position a hair either mesially or distally, their number is legion. Again how many of our dentists are color blind? Every day crowns are seen of a different shade from those of the natural teeth. What a pity, when with a little care and watchfulness, the exact shade can be reproduced. How the looks of many mouths, otherwise good and perfect, are spoiled by the appearance of a facing just a little off color, it has changed during soldering, or the dentist has not been careful enough in picking out the shade, and he is either too busy or does not care, thinks it is near enough to the proper shade, or he may be color blind. Let us hope that it is the latter, for then he cannot be blamed so much, that is of course, if he does not know that he cannot distinguish colors. We would not like to think that he let it go because he was careless, and supposes that it will never be noticed. It will be noticed, sooner or later some kind friend will say "Why your crowned tooth is not the same color as your own teeth. What dentist did it for you? Now, if you have any more work to be done you must go and see my dentist. He would not let a piece of work like that go out of his office." The result is, your patient loses confidence in you, and somebody who needs patients loses them, and somebody gains them. How many crowns do we see with a broad line of gold showing at the margin of the gums, where the band has not been properly cut out, or contoured, and these margins have receded. It does not look very artistic. Now to be artistic, work of this kind must be perfect from the beginning; the root must be properly prepared, and the band fitted perfectly; then a good foundation to begin upon has been secured. There are more failures from imperfectly fitting bands than from most any other cause. Another cause of failure is from the use of too soft a gold, for I do not believe that a durable crown or bridge, that will stand the wear and tear of mastication, can be made of twenty-four carat or soft twenty-two carat gold, although the claim has often been put forth that the soft gold was the best, as it was so much easier to adapt to the roots. The short experience that I have had, proves to my mind, that too soft a gold will not make a crown or bridge that will stand the immense strain that is put upon it, during the process of mastication.

Now take into consideration the strain on the centrals and lat-

erals from 60 to 100 pounds, cuspids from 85 to 125 pounds, bicuspid from 125 to 200 pounds, and sometimes more. Does any one imagine that soft gold will stand that strain? If he does he makes a mistake, and he may find it to be rather a costly one. A few months after putting on, a bridge will return, not the nice appearing one that has been put on, with the articulation correct, but a bridge that has sagged in the middle, and it will be found that the change, due to the force from mastication, has caused the abutments to incline toward each other, also that the bands do not fit at the gingival margin. In fact after a few months' wear, it does not look artistic at all. The patient is not in love with it, and goes to some one else to see what can be done with it. Another point that is oftentimes neglected or overlooked in making a bridge, is that of cleanliness. There are very few permanent or stationary bridges that are self-cleansing, especially those that include the bicuspid and molars. Most of these are made with the neck of the facings or dummies resting on the outer side of the alveolar ridge, with the under surface concave, trusting to the tongue and a toothbrush, that you cannot get in there with, to keep the space free from all collections. I do not imagine that the smell or taste from them is very artistic. Now would it not be better if the underpart of the bridge were made flat and the surface continuous, with plenty of space between the bridge and the alveolar ridge so the patient can take a toothpick and keep the surface clean in this way, not giving them a chance to complain of the foul odor and taste that comes from it. I wish that I were enough of an artist with the crayon or chalk, to picture some of the nonartistic and unmechanically constructed bridges that are put into people's mouths, but I am not. Now if a patient presented himself with a central incisor gone and wanted one bridged in, would it be satisfactory to us if we wished to do the best for ourselves and our patient if we took a facing, and soldered to each side a band that would slip over the incisal edge of the central and lateral without paying any attention to the fit of the band at the neck of the teeth and cemented it in place? I think not, but yet we see them. Here is a sample of a bridge made on that plan, except that this one is made to bridge the bicuspid space. This may be artistic, but I fail to see it, and I am sure the patient does not see it when he finds that he will have to lose at least one tooth. Of course he speaks well of the dentist who made it.

Another style of a small bridge that is used quite extensively, is a lateral incisor or bicuspid swung on to an open faced shell that fits over the cuspid, unless perfectly fitted, the state of affairs will be something like this (drawing). When one depends upon the cement to hold crowns or bridges in place, he "builds upon the sands," for the cement will wash out, and "great will be the fall of that crown or bridge." Another piece of artistic work, oftentimes will be noticed in the mouths of respectable women, the incisors and cuspids of which are replaced by glaring gold shells. When this work is being done, the women do not know that such things are characteristic of the women of the street, but sooner or later they will want to know if a change cannot be made, as they do not think so much gold in the front of the mouth looks very well. If sufficient care be taken with the work, sufficient consideration given to the strain upon the abutments, these end piers prepared carefully, the bands fitted perfectly, sufficient care taken in selecting the right shade of teeth; the proper occlusion and expression obtained, then with proper use of blowpipe and solder, we may expect to have a piece of work, that will be perfect mechanically, and also artistically, and I am sure, that if the patient takes a drink of ice water, that the difference between the temperature of the mouth, and the temperature of the draught will not "crack the china off."

A FEW THOUGHTS ON THE ESSENTIALS OF SOLDERING.*

BY H. J. GOSLEE, D. D. S., CHICAGO, ILL.

That successful soldering as applied to dentistry, has assumed in itself almost the significance of an "*art*" and of a much greater degree than ever attained by the jeweler or goldsmith, cannot indeed be disputed, much less doubted by any one; and is very readily apparent to all who may have had even a meager or limited experience, or indulged in observation to any extent; and can moreover be noted particularly by the comparative ease with which its manipulation is executed by some, and the expressions of, I may say dread—manifested by others less familiar with or experienced toward this particular part of an operation; together with the easily successful and even beautiful results obtained by some, while others are more or less constantly harassed and discouraged

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by incessant, or occasional failures, such as the burning or fusing of the parts to be soldered, during the process of soldering ; or the checking or fracturing of porcelain facings, and when we note the frequent occurrence of both, and more especially the latter, we are led to the conclusion that the lesson of *soldering* has not been properly learned by us all, and that this work merits perhaps a little deeper study, and a little more thought than most of us are prone to give it ; hence, your kind indulgence is asked in presenting these few thoughts, from—be it understood—a purely practical standpoint, which may be of interest to some, not alone from the logic contained therein, but by eliciting a discussion which may prove both beneficial and instructive in nature; however your essayist conceives and realizes that, though undoubtedly a subject of some importance, it is perhaps a narrow one ; and shall make no attempt in this brief treatise to aspire to a highly scientific plane, but simply treat a practical matter in a practical manner.

To begin with, the essential elements of soldering are: The thorough removal of all oxidation from the surfaces to be united; contact or apposition of the parts; the use of a *flux* upon the surfaces of both metal and solder, which permits the latter to flow readily, and of union between them, by preventing oxidation ; and the heating up of the object to be soldered—whether it be in an investment or not—to or near the degree of heat required to fuse the solder, before any attempt is made to do so.

Now the definition of solder, as we understand it, is a combination of metals which fuse lower than the highest fusing component part ; zinc being mostly used in the ordinary gold solders as the baser incorporate, by which the fusing point of the mass is reduced and regulated, imparting also increased properties of flowing. Consequently a twenty carat solder for instance, will fuse lower than plate of the same carat, otherwise it would not be a solder ; and yet there are some, I dare say, who would not think of using a twenty-two carat solder to unite plate of the same carat, while it may, of course, be done with perfect ease, and in cases which require two or three solderings to good advantage, as such would in that case facilitate matters by lessening the possibility of unsoldering parts already attached, during the subjection of same to subsequent soldering, enabling you, at the same time, to accomplish a desired result by using as high a carat as possible in finishing.

Perhaps paramount among the difficulties encountered in or connected with the soldering of plate or crown and bridge work is the apparent unavoidable fracturing of porcelain facings ; and while it now seems probable that the coming work of this kind may, perhaps, be done without subjecting the porcelain to the heat of soldering, "but by the method already in vogue, apparently to some considerable extent, of simply soldering the backings which have previously been perfectly fitted and adapted, in their respective or relative positions, and subsequently retaining the facings by means of cementing and riveting ;" it is, at the same time, perhaps just as well to consider for a moment the *cause* of the frequent checking of facings, for, in my present opinion, which is based upon my own observation and experience only, there seems to me to be no imperative reason why it cannot be avoided in no limited percentage of cases ; though we are aware at the same time that some of our best men in this line do not hesitate to make the broad assertion, "that few facings are ever entirely devoid of checks after soldering," and contend that if the same at the time are not noticeable to the eye, they are conspicuously so when the facing is subjected to the *lens*, or that they materialize and appear in time.

It must be remembered that a porcelain facing in itself presents two substances, the porcelain or feldspar, and the platinum pins, each of which is affected entirely different by the great amount of heat necessary to solder ; the former absorbing and retaining the heat for a considerable length of time, and the latter, while absorbing it readily, gives it off or cools with equal rapidity ; consequently when a tooth, properly backed, is to be soldered too much care cannot be exercised in cautiously and evenly distributing the heat from the beginning of its application, so that the porcelain which is usually farthest away and covered or protected by an investment material, receive it in equal proportion simultaneously with the metal ; otherwise the metal receiving the bulk of the heat first rapidly through the medium of the platinum pins conducts it to the porcelain before the latter is correspondingly and sufficiently heated to avoid *uneven expansion*, and as a result, the characteristics of the substances considered, what would be more natural than the occurrence of a fracture in the more brittle and friable material, usually across the center of the facing, on a line with the pins.

Acknowledging this then to be one and perhaps the main

cause, it is evident and conclusive that it can be avoided by so regulating the application of the heat that the investment, which is usually a poor conductor, receives the most of it, or entirely so, until the whole shall have reached a high degree, which having come from the outside as it were, must have been equally and evenly distributed ; and furthermore, as a precautionary means, the platinum pins should always be cut off as close as possible to the backing, only leaving enough remaining to retain same in its proper relation to the facing by splitting or riveting them ; for if left standing out straight or bent over upon the backing, they must necessarily by virtue of their prominence receive the bulk of the heat from the blowpipe as soon as the flame is directed upon the backing.

Great care is also necessary in the preparation of a facing to receive its backing, and in the perfect adaptation of the backing to the same, that no overhanging edges of the metal be left upon the porcelain, as this will invariably result in a fracture or numerous small checks occurring along the edges of the facing so neglected and due to the impingement upon the porcelain, occasioned by the contraction of the solder upon the backing in cooling ; and in this respect, and of equal importance of course is the arrangement of the teeth in alignment, that sufficient space be left between them to allow for the taking place of this same physical change in the metal upon cooling ; and it may also be well to add that after the soldering is completed the utmost care should be exercised in excluding any draught of air which may have a tendency to prevent the contraction of porcelain and metal taking place gradually and at the same time, and no attempt should of course be made to remove the case from the investment until this may have taken place and both are cool.

The extravagant and injudicious use of *borax* is another cause of numerous cracked facings, as it fuses lower than solder, and owing to the expansion of the average investment material it is thereby permitted to run out over the edges of the backing upon the surfaces of the porcelain and usually or invariably results in fracturing the latter by giving off its heat and contracting much sooner.

The use of perhaps the most commonly used investment material, consisting of pumice stone in conjunction with plaster of Paris, presents, we believe, very objectionable features and of suf-

ficient detriment, especially regarding its use in connection with porcelain facings, as to cause it to be avoided ; for, to begin with, it is a poor conductor of heat, expands very readily and unless protected by a ferrule of metal, or by wiring tightly together, or by being much larger in bulk than either desirous or necessary, it invariably cracks open or falls apart, rendering liable the exposure of the heated facing to the air, which of course results in fracturing same ; and again the pumice stone, like borax, fuses lower than the ordinary solders, and if in contact with adheres to the surface of the teeth, and in cooling and contracting much sooner renders liable the presentation of the same undesired result.

Believing then, after careful consideration and numerous experiments that in these we can safely concede the maximum number of probable *causes* of this particular *bugbear*, I experience no hesitancy in maintaining that if the proper care, skill and judgment be exercised there is no necessity, and indeed very little excuse for the fracturing of porcelain facings during the process of soldering, and consequently can see but little advantage or merits in the method hereinbefore referred to “of simply soldering the backings and subsequently retaining the facings by means of cementing and riveting,” and likewise feel no hesitancy in proclaiming it to be more of a *fad* than anything else, and certainly possessing more disadvantages than advantages; however, confining myself to the—let me say—conscientious expressions regarding the unnecessary cracking of facings in soldering; we can in this respect refer to the similar assertions of no less an authority than Dr. E. T. Starr, of Philadelphia, a gentleman who has devoted almost a lifetime to the study of the characteristics of the materials used, and to the manufacture of porcelain teeth; and moreover to corroborate these assertions let us think why it is that so few facings are cracked in the construction of *porcelain work* where they are subjected to the heat of both the high and low fusing bodies. True they are occasionally fractured even then, but very seldom and the ratio is certainly much less as compared with metal work.

Is it not because the porcelain and metal being enclosed in the muffle receive the heat at the same time, expand and contract under its influence together, that there is no overhanging edges of metal backings to impinge, and that there is no borax or low fusing investment materials to interfere?

And now a few words regarding the appearance of these cracks

or fractures occurring or presenting themselves at some later period, as previously referred to and contended by some. It seems very evident to me that when they do occur, and I regret to say that it is only too often, that it is due, *not* to the fracture having been there since the tooth was subjected to the soldering, but more likely to negligent or poor adaptation of its backing, rendering in itself no protection whatever to the facing from the continued strain brought to bear upon it in the force of mastication, and I think it is safe to say that there are not one-fourth of the facings used, whether they be on plates or crowns or bridges, that are properly protected to withstand the ravages of this powerful force.

To see a facing badly checked or entirely broken off of a crown or bridge after same has been worn for some little time is by no means an uncommon occurrence with most of us, but to attribute this to the belief that it was due to the soldering, and has been present though perhaps not visible since that time, seems hardly consistent, when, as a usual thing, all we have to do is to examine the broken facing and we will almost invariably see that that facing has had little or no protection along the cutting edge, and it is perhaps reasonable to infer that it lasted quite as long as could well be expected under the circumstances; for when we stop to consider the amount of force to which a facing is, and must be subjected in masticating, and remember that it is retained by means of its attachment in a position both rigid and unyielding to the slightest extent, how can we overlook so important an essential as providing for the proper protection of them against any possible unnecessary strain, when the same can be accomplished with very little more work, and much more gratifying results.

I am of the opinion that crown and bridge work would in the long run prove less laborious, and infinitely more successful and satisfactory to both dentist and patient, if all were inclined to make an endeavor to remedy this evil, and regard this part of the operation as almost next in importance to the fit and adaptation of a crown to the root.

To accomplish this the facing should first be ground to assume its proper position and fit accurately, after which the lingual portion of the cutting edge should be so ground as to produce a sharp but smooth angle along the edge, the bevel extending to about one-half the distance to the pins; then the lateral sides should be slightly ground to give a smooth marginal edge to which

the backing may be finished nicely and without danger of overhanging edges. Use preferably pure gold from twenty-nine to thirty gauge and after burnishing to fit nicely and leaving a small margin of surplus around the edges, it then should be removed and reënforced with plate or high karat solder to desired thickness. After it is sufficiently reënforced to insure strength, replaced upon tooth and riveted, the smooth marginal edges will enable it to be finished down to a fine line, leaving a joint when finished so close as to render it practically impervious, but in dressing it down along the cutting edge the file should be passed on a parallel line with the face of the tooth, which as can readily be seen will leave the thickness of the metal covering and protecting this edge, and which can be left of a uniform and desired thickness to receive the force of mastication and relieve the porcelain of all strain.

Respectfully submitting this humble but candidly conscientious surmise of cause, effect and remedy to your consideration, we will deviate slightly and yet not digress from the line of thoughts which mark the restrictions of our subject matter.

Another great annoyance along the line of soldering, and of not uncommon occurrence is the tendency of solder to *ball up*—and which is invariably due to the endeavor to cause it to flow before the parts to be united are sufficiently heated, for as the affinity one metal for another is increased by heat, it is imperative to first gradually raise the heat of the higher fusing metal to or near the degree at which the solder will fuse and after accomplishing this, by applying the solder and then directing the flame upon both the surfaces of the parts and of the solder having previously been fluxed with a thin paste of borax, no difficulty will be experienced in causing the solder to flow nicely with but a small pointed flame from the ordinary blowpipe and without any exertion whatever; but if on the contrary the flame be directed upon the solder before the parts to be united are sufficiently heated, it will fuse within itself and ball up, and if much time be thus consumed the baser alloy or zinc will be burned out, requiring in consequence a greater degree of heat to cause it to flow than otherwise, and as the depletion of the zinc will to some extent increase the fusing point and decrease its flowing properties, the liability of fusing or burning the object to be soldered is also increased.

The parts should be fluxed before heating up, and it is always

necessary to flux well the surface of the solder before attempting to control it, as containing zinc renders it so easily oxidizable, it will not flow or cannot be managed unless it is properly fluxed, and in this respect it may be well to emphasize the fact that the borax should be mixed into a thin paste and applied with a small camel's hair brush or similar means, as the quantity used can be governed better and its application be made only where it is needed, thus avoiding the common and by far too generous use of powdered borax, which as has been previously stated increases the danger of cracking the teeth, renders the solder more difficult to handle and oftentimes causes the surface of the work to be freely covered with small pits.

For *investing* there are perhaps several substances which in conjunction with plaster, possess all the desired qualities and advantages ; however, we are inclined to use and give preference to the use of a material composed of ordinary fine white lake sand, one-third, and plaster two-thirds, believing it to meet the requirements as well as any and much better than some, for being considerable coarser than many, it conducts the heat better, does not expand so readily and the sand fusing so much higher than pumice stone avoids the previously mentioned objectionable liability in connection with that substance.

The investment should be no larger in size or bulk than merely sufficient to cover and protect the teeth and retain the parts in position and should be protected from expansion as much as possible by a narrow rim or ferrule of metal, or by being poured on to finely interlaced wire netting.

In instances where the parts to be soldered are not in contact one with the other, as frequently occurs, the space or spaces between may be filled in with foil gold to good advantage and thus bridged across, render the work of uniting them very simple ; or with the use of a pointed steel instrument, the solder when just beginning to fuse can be pulled or coaxed over and across such spaces with ease.

In *coaxing* and in the controlling and management of solder, it is of much material assistance to see and note that *gravity* be favorable, for no matter how skillful one may become, it is of course somewhat difficult to cause a given mass to run up hill against its own weight, consequently in uniting a piece of two or more teeth for instance, and especially if it be for the anterior part

of the mouth where the curvature is greater, it is necessary to change the relative position as you progress, in order that the solder may run where it is required and remain when fused in the desired location.

Another not unusual occurrence of no little annoyance in the construction of a plate or crown, is the appearance of one or more small holes in the metal during the process of annealing and swaging and which is usually due to the presence of a baser metal upon the surface of the gold, usually tin or lead, which fusing so much lower than the gold, becomes incorporated at its point of contact when same is being annealed, and results in the presence of a small hole. This baser metal is usually deposited upon the surface from contact with the dies during the progress of swaging, and the same with its aggravating results can of course be easily avoided by treating the metal to the acid bath after each swaging, being careful afterward, however, to thoroughly neutralize the acid by the free application of water before again attempting to heat or solder.

When the burning of such a hole does occur, or when one presents itself during the process of finishing, it can easily be obliterated with the use of a solder of same carat as gold by *sweating* over it a piece some little larger than the hole from the side not interfering with the fit or adaptation. In so doing it should not be the attempt or desire to fuse the solder until it flows, but by first thoroughly cleaning and removing oxidation; investing if necessary to prevent unsoldering or for protection of porcelain; properly fluxing the surfaces of metal and solder; heating to a red heat and then simply *wilting* or *sweating* the solder down to its place by the use of a small pointed intermittent flame from the blowpipe only until it becomes firmly attached without flowing perceptibly, then ceasing; the desired result is accomplished with comparative ease and very little danger.

If no investment be used, or necessary, or even in cases where same is required, a precautionary means is frequently necessary to prevent the unsoldering of the parts; this can be very easily done by covering or coating such surfaces with either a solution of whiting or of plumbago, carbon or crocus (ferric hydrate) any of which will relieve all danger from that source.

I am of the impression that so far as soldering is concerned the use of the bellows is rarely if ever indicated, and should in fact

be avoided, for the amount of heat necessary, which is usually very much overestimated by the way, cannot be so well regulated, and more harm than good is liable to result in consequence; and furthermore, a greater amount of heat than the combination mouth governed blowpipe will give, if properly applied is very seldom required, but to blow a continuous flame is a very valuable accomplishment for the dentist doing gold work, and can be learned by most any one devoting to it a little perseverance and application.

Some little thought and careful observation of our own work in this line will enable us to acquire a degree of proficiency that will render soldering a very simple matter.

GOLD BEATING.*

BY E. A. ROYCE, D. D. S., CHICAGO. ILL.

Some of those present this evening will probably remember that I read a paper before this society in 1893 on "The Spreading Properties of Gold," in the discussion of which Dr. Harlan used the following language:

"With reference to the matter which he (Dr. Royce) brings before us to-night, the philosophy of the impaction and spreading of gold has been demonstrated on strictly mechanical principles that are capable of being verified. In the beating of gold it is taken, after being rolled into sheets and cut into small squares, and placed between the skins in the center of the book, then it is enveloped from side to side sufficiently well, so that the gold beater with his hammer also based on mechanical principles, by pounding it causes it to spread, and that is the theory, because if it were not, gold beating would be done in an entirely different manner; therefore, the philosophy of the matter of impact is correct. The philosophy of the spreading of gold is correct."

I call your attention to this as it is the introduction of gold beating into the discussion of the delivery of force by plugger points, and I also ask you to note particularly the emphasis placed by Dr. Harlan on the fact that the gold beater's hammer is shaped according to mechanical principles for the delivery of the force required by the gold beater, which is a spreading force.

Some time after this a paper was read before the Hayden Dental Society criticising the theories advanced by me in regard to the

*Read before the Chicago Dental Society February 4, 1896.

mechanical principles controlling the delivery of force, and taking up at length the process of gold beating, claiming that a gold beater could spread gold because his hammer covered the entire surface of the gold at every blow, but the dentist could not take advantage of this spreading force because his instrument only covered a small portion of the gold at each blow. This and other points were answered by me in a paper read before the Odontological Society in 1894, at which time I gave a number of experiments showing the delivery of force from flat and rounded faces, but it is evident from the paper presented at the October meeting (1895) of this society that my explanation of the subject was not considered conclusive, for in that paper we find the following :

“ I regret that I did not know that he was unfamiliar with the gold beater’s work and was obliged to write for information, for within almost a stone’s throw of his office is one of the largest gold beating establishments in the West, where he, like I, could for himself examine and measure the hammers, anvils, gold and all, and indeed can beat and spread the gold if he so chooses. * * * If my critic had remembered that the piece of gold with which the gold beater begins is only from three-fourths of an inch to one inch in size, and that the point of contact is admitted to be three-fourths of an inch, but depends on the force of the blow and may therefore be more, he would have noticed that the entire surface of the gold is covered by the first blow of the hammer. Now, then, as the hammer in the act of striking the pack causes the gold to spread it ‘crawls,’ for want of a better term, or ‘creeps,’ if you please, up the convex surface of the hammer, and when the gold beater is done the face of the hammer being four and three-fourths inches the leaf of gold has also spread to four and three-fourths inches, and as each blow was struck, including the last one, the contact of the face of the hammer was conveyed through the alternate layers of intestinal membrane and gold to every particle of gold. Hence, from the original size of three-fourths of an inch to four and three-fourths inches the hammer was in contact with, or rather the contact was conveyed to each layer of gold. So much for a comparison with gold beating and the supposition that I made an error of four inches.”

When the paper was read I understood this to mean that the face of the hammer is in contact with the entire surface of the gold at every stroke during the process of beating, but as this point had

already been discussed by us and a letter from one of the largest gold beaters in the United States produced by me, which stated that the point of contact was only about three-fourths of an inch, I thought I might have failed to comprehend the meaning of the essayist, therefore I said nothing about this point in the discussion which followed the paper, and afterward wrote to him asking if he still believed that when the last blow is struck upon the pack the entire face of the hammer is in contact with the pack. I received the following very definite reply :

“ While the beating of the gold, as stated in my paper, is not an appropriate simile and the information you ask for can in no wise affect the principals involved in gold packing, I have no hesitancy in saying that if any one doubts that the full face of the hammer is in contact with the pack at the moment when the blow is struck I will convince the doubter if he will put the end of his little finger at the point where he thinks the hammer and the pack do not come in contact.”

Now, while the test suggested in this note might be eminently satisfactory and conclusive to the writer, it would be very unsatisfactory to the other party making the test, for the oval of the gold beater's hammer is only one-fourth of an inch and a finger placed anywhere between the face of the hammer and the pack must *necessarily* be pinched, but that does not by any means prove *contact* between the pack and the entire face of the hammer to one who is making accurate investigations.

As to the condition of the gold and the pack when the first blow is struck we do not disagree. The gold when first put into the pack is from three-fourths to one inch square. The first two or three blows are struck in the center of the pack, and the gold is spread slightly. The gold beaters say it “crawls” up the face of the hammer, leaving the gold thicker at the edges than in the center. Now do they continue to strike in the center of the pack? Not by any means. If the force was delivered in the same place the gold would continue to spread in the same manner, the edges still thicker than the center and the contact of the hammer increasing in size as fast as the gold spreads, until, finally, if there was a sufficient thickness of gold in the pack the contact would be the size of the face of the hammer, and the gold would be enough thicker at the edges than in the center to equal the oval of the face of the hammer, which is one-fourth of an inch. Have you ever

detected thick edges on your gold? Moreover, the sheet would be round and only the size of the hammer, four and three-eighths inches (and just here let me say that the largest hammer that I saw measured four and three-eighths inches). But I have here a sheet of gold that measures six inches diagonally across it, so we have one and five-eighths inches of beaten gold extending beyond the face of the hammer. Now, as I am a dentist and not a gold beater, I have never taken the time to familiarize myself with the detail of their work, being content to rely upon the written statement of a gold beater who, after years of practice, ought to know his business, for the information which I needed, as I did not suppose the simple question of the contact between the gold beater's hammer and pack would cause such a lengthy discussion, but I found that either my information was wrong or else my critic was wrong, so I commenced a personal investigation, which I think can hardly be otherwise than accurate, and I hope will convince the doubting that the mistake of four inches was *not* made by my informant.

One of the most noticeable things in the gold beater's work, and one in which much of his skill lies, is the manner in which, as the gold spreads, he enlarges the surface to which force is applied, *not* by increasing the size of point of contact between the hammer and the pack but by changing the pack so that no two blows in succession strike in the same place. When the gold is spread nearly to its full size, and the pack is turned, we will say for the last time, the next blow is struck at the right hand corner nearest to the beater; the next is about one inch above or away from the beater, and so on until the right-hand side of the pack receives its quota of blows, say five or six; then beginning again at the side nearest the beater the next blow is struck about one inch to the left of the first blow, and that strip of about one inch in width is beaten and so each strip receives its certain number of blows until the entire surface of the pack is beaten. Each blow of the hammer exerting force upon something less than one inch square.

I found a gold beater who was willing to assist me in my experimenting. He had a pack just ready to begin beating, and in order to obtain an impression of the contact between the hammer and the pack I placed upon it a piece of carbonized paper between two leaves of white paper. I will show you the result. You see the impression is about one and one-half inches. I used a carbonized paper that would leave an impression upon the slightest pres-

sure, as I wished to get a mark that would show not only the space from which force was delivered to the gold, but also the entire contact between the hammer and skin, for you can readily see that the skin naturally rises a little to meet the face of the hammer outside of the circle that is driven down by the very center of the hammer. Another man in this room had a pack he was just about to finish, so I took another paper and as he turned his pack for the last time I placed this paper upon the top. The first blow was struck as before described at the lower right-hand corner, and the right-hand side of the pack was beaten; but during the process, much to the disgust of the beater and to my delight, the paper moved, so I have, by themselves and distinctly outlined, the marks of two of these blows, and they measure a trifle less than the mark obtained by the first test. At the top of the paper the blows are near enough together to perfectly blend, showing how nicely a skillful beater will go over the pack to coax the gold out evenly, leaving no hollows and no ridges to mark the blows of the hammer.

The impressions which I show you to-night are as conclusive evidence as photography, and they show that the greatest contact between the hammer and the pack is measured by a circle whose diameter is not more than one and one-half inches, and the smaller ones only an inch. The largest square that can be covered by a circle is one whose diagonal equals the diameter of the circle; we find the diagonal of a square inch equals the diameter of the circle which measures the largest point of contact. A sheet of untrimmed gold is four and three-fourths inches by four and three-fourths inches, and contains a trifle over twenty-two square inches, and as one square inch is the largest square that can be covered by each blow of the gold beater's hammer, it is readily seen that at least twenty-two blows (instead of one) will be required to apply force to the entire surface of the sheet of gold mentioned. All that my critic has said and written upon the delivery of force may seem plausible and read well, but his statements are very misleading, and in all of his mechanical theories he is as far from being correct as he was in his gold-beating investigations, in which he missed twenty-one blows out of twenty-two.

In view of these facts, I would present the beating of gold as one of the most remarkable examples of the spreading of metal by the application of a spreading force to a portion of the surface at a time. This must dispose entirely of the idea that the dentist

cannot benefit by the use of a spreading force, because he cannot apply force to the whole face of the filling at each stroke of the mallet. On the contrary, it is one of the strongest arguments in favor of the intelligent use of that force in gold filling.

GIVE US A REST.*

BY F. S. JAMES, TRACY, MINN.

Mr. President and Gentlemen: My subject may seem a little strange, but such was not my intention. In thinking over the matter of writing a paper I became somewhat weary, and after casting aside all the subjects that I had ever heard of, I thought the above would be appropriate. The old saying which we have all heard for years, "all work and no play makes Jack a dull boy," applies to us as well as those in other vocations. There are many ways of taking a rest. Some need quiet; some merely a change of scenes, while others seek rest by climbing mountains or other active sports; however this may be, we will, I think, all agree that it is good for an individual to get away from himself occasionally; leave the cares of the office at home, and seek health and pleasure, or both, and at the end of the year he will not only find himself better off physically, but financially as well.

Sir Andrew Clark, the celebrated English physician, defines health as that state in which the body is not consciously present to us; that state in which work is easy and duty not overgreat; that state in which it is a joy to see, to think, to feel, and to be.

There are hundreds of men in the dental profession who think they cannot possibly close their offices for a day, not even to attend a society meeting; day after day, year after year they plod along and leave a name to live, but are dead to the profession, the world and all mankind, except, possibly, a few who, through the busy din of life happen to stumble upon them. They identify themselves with nothing; they pass along the silent paths of obscurity as if they had no object in life or purpose in view; they drop their bodies into the dust, and but few know of their death because they are not identified with the living and active, and their loss is seldom mourned outside their immediate surroundings.

The past, and even the present system of education, to a cer-

* Read before the Minnesota Dental Society.

tain extent, has wanted one class of men to do the thinking, and the other class to do the working; the one is called the gentleman, the other the operator. Whereas the workman ought to be thinking, and the thinker often to be working, and both should be gentlemen in the true sense of the word. As it is, or has been, both have been made ungentle—the one envying, the other despising the other—and the mass of society is made up of morbid, unhealthy thinkers, and miserable workers. It is only by hard work that thought can be made happy, and we, as a profession, should remember this and be more liberal; then there will be less pride felt in the peculiarity of our calling, and more in the excellence of our achievements.

Now then, if we are to be rational and intelligent men, let us strive to keep abreast with the times. With the aid of our societies, and a score or more of dental journals, there is no excuse for a dentist who will not keep himself posted in all that is going on in his special calling. If we are to receive any great good, it is necessary to have something which will stimulate us.

It has been said that if a man would be wise he must “think, think, think,” but it is hard to think energetically and persistently without something to stimulate thought, and nothing in this line is better than association with others in the same calling.

Dentists who attend society meetings are benefited in this and many other ways as well, and those who do not avail themselves of this manner of stimulation (or rest, we might call it, for that is what it is to most of us), may continue along in the same old rut, and, professionally, they become fossils. This may be their misfortune, but it is more often their own fault, and their intelligent clients are sure to hold them responsible accordingly.

When it is a man's misfortune that he cannot avail himself of the best means of improvements he is to be pitied, for he is an object of sympathy, but in most cases the inability is more imaginary than real. I say, and you will probably agree with me, “Give us a rest.”

ARTISTIC DENTAL SURGERY.

BY L. P. HASKELL, D. D. S., CHICAGO, ILL.

The dental profession is greatly indebted to Dr. W. J. Younger for some of the most notable advances in dental surgery.

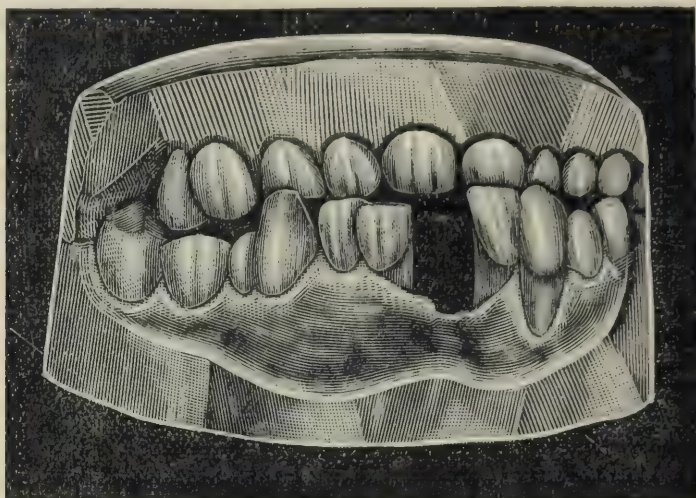


FIG. 1.

Implantation, which he has been practicing with marked success for ten years past, and doing more of it now than ever.

The successful treatment of that enigma of dentistry, *pyorrhœa*, even in its worst forms.

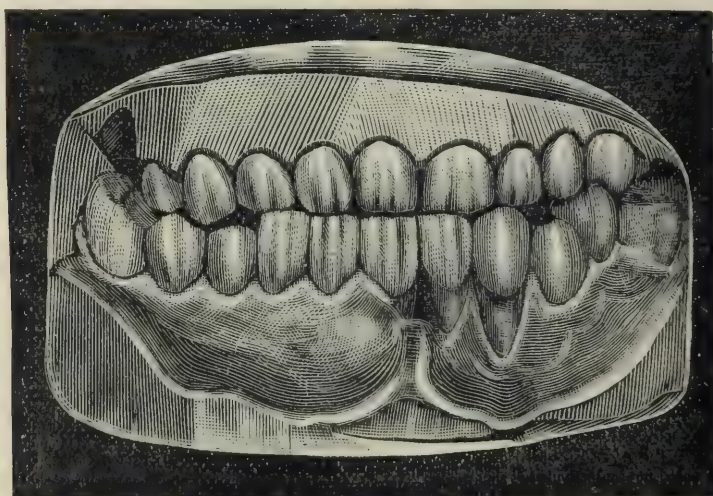


FIG. 2.

The *correction of irregularities* by the use, exclusively, of the *silk ligature*. I have seen some of these cases, hitherto supposed to be amenable only to springs, screws, or plates, and yet restored to perfect contour, and patients well advanced in years.

And then what may be termed *artistic dental surgery*, an illustration of which is herewith given, cut No. 1 shows the lower jaw with a central incisor missing. Cut No. 2 shows the case after treatment. The right central, lateral and cuspid teeth moved bodily to the left so as to completely fill the space. The right first bicuspid moved into line. It will be seen that the root of the left cuspid is exposed to the apex. In cut No. 2 it is partly covered with membrane. In doing work of this character he trims unsightly shaped teeth into shape, making them "things of beauty and a joy forever."

There is a delicacy of touch and deftness of manipulation, especially in applying the ligatures and tying of knots, not often seen. In his operations, as one lady expressed it, "he is as gentle as a woman." He is now in Chicago for the second time this winter, expecting to remain two weeks, but has been here four months and finds it difficult to get away to meet further appointments in New York.

THE NEW MAT GOLD AND ACCESSORIES.*†

BY L. C. BRYAN, D. D. S., BASEL, SWITZERLAND.

In fulfillment of my promise to give the profession some notes on the use of solila mat gold I have prepared a paper of some length, and proposed to have it read before your meeting, but at the last moment Dr. Victor de Trey signified his intention of bringing the gold again before the society at this meeting, and I have, therefore, taken that paper with me to read before the American Dental Association, which meets August 6, in Asbury Park. Dr. de Trey will, no doubt, do the subject more justice than I have done. I give you, however, herewith a copy of the result of an interview with Dr. de Trey, which mentions most of the points of interest in relation to the gold and the instruments used in filling with it. After a short use of the gold I have only good results and can recommend a trial, most heartily.

The *saw frame holder* has a shorter blade than the "keber" holder. As the ends of the saw are smooth, neither the tongue

*Read before the American Dental Society of Europe.

†Received too late to go into the proceedings of the society. See the February issue of the DENTAL REVIEW.

nor the lips can be hurt, all the more so that by a contrivance the blade is made to slide into rubber.

The curved shape of the holder renders it possible to separate and work on spaces between molar teeth which otherwise would be quite unapproachable with the straight handles. Either a polisher or a saw, or any other blade can be fitted into this holder.

I make my own, and they are not on the market as yet, but any one of a mechanical turn can make his own as he can any of the instruments presented by me.

The *cervical tooth clamp* is very easy to hold, as the fingers and thumb have a good grip of the roughened handle. By pressing the back, the back half of the clamp can be made to slide up or down so as to adjust it at the back of the tooth. The front bow (arc) having been cut, it can be bent in every direction, so that it can be fitted to the most irregular cavity by bending in the desired direction either half.

The clamp can be made of steel, the edges will then be sharp and can be well fastened on and clamped in position with the screw. When the clamp is fastened to the tooth the screw can be turned quickly on by its rough edges, so that the clamp is made fast in the desired position. This clamp will fit on to bicuspsids as well as incisors, and I have been able to fasten it on to every tooth I have tried as yet.

The sponge holder with mirror to moisten the corundum or any other grinding wheel, protects at the same time the tongue and lips. It catches the gold that falls when polishing, and keeps the corundum cold, sharp and clean.

"Moistening pads," or any other moisture holder, can be used with it, but clippings of sponges are preferable, as they do not catch in the grinding or polishing wheels. Sponges or pads should be kept at hand ready moist in a dish of water, and after use on gold fillings should be saved and burned to recover the gold scrap. After grinding down and burnishing, dip the wet sponge in the polishing powder to be used in polishing the filling, and convey to the tooth and the revolving wood or buff wheel.

Mirror with shell-shaped rim. This is very useful when filling the upper teeth, as it conveys filling material to the cavity and catches all the fragments which may drop during the operation; it throws light upon the tooth and cavity and reflects operation at the same time. Moreover it is useful in

catching chips and old fillings or any other small subject removed from the cavity or teeth. It can also be used with advantage in excavating and treating, or when using the engine, by those who work by reflection in the mirror. By means of the rimmed mirror, gold crowns and other fixtures can be easily placed on the right spot and held while adjusting. I presented this mirror to the American Dental Society of Europe in Paris in 1889. Dr. Sachs has within a year published cuts of this same mirror in a German dental journal as his invention and assures me that he never saw mine. I have bills from makers and letters from others which show that I used it and gave it to friends of mine at least six years ago. It doesn't matter, however who invented it. It is a useful instrument and especially with the mat golds, new and old, saves much waste of valuable filling material.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

Regular meeting March 3d, 1896, Dr. J. Austin Dunn in the chair.

Dr. C. E. Bentley read a paper entitled, "To What extent are Internal Remedies a Necessity in the Practice of Dentistry?"

DISCUSSION.

Dr. C. P. PRUYN: We have certainly been regaled with an interesting paper which has taken a view of the question under consideration a little out of the beaten channels. It seems to me, the general trend of the paper would indicate that the essayist was laboring under the impression that he was talking to machine doctors, to the men who rely principally upon a specific for each particular disease. I think those days have passed. We are now living in a progressive age, and the man who confines himself to prescriptions for special diseases is the man who is away behind the times. He is a man whom it is impossible to raise up to an appreciation of the needs of the physical system; he is a man who is dealing with symptoms, and symptoms only, and the man who deals with symptoms alone is the one who will commit many grave errors. We must do something more than relieve symptoms, whatever they are. We must go further than that. We must seek

the causes which produce them, and it seems to me foolish to confine ourselves to symptoms and the relief of them.

He spoke of the use of *veratrum viride* in cases of pneumonia which relieved some of the symptoms, but did not remove the cause, which should have been attended to, and in the treatment of diseases the first thing is to give attention to the cause. What is the matter? What are the causes which produce the symptoms? Unless a man goes at the practice of medicine and dentistry with that in mind he is continually laboring in the dark, and that is the thing we want to avoid. What is the cause? Find out what is the matter. (Here Dr. Pruyn related a story about the late Dr. James Adams Allen, of this city, who in his lectures to medical students always emphasized the importance of finding out what was the matter with a patient before instituting treatment.) Dr. Allen maintained that it was highly important for the physician to get the clinical history and the symptoms and physical signs of a case before he could prescribe intelligently. This we want to bear in mind to-day, otherwise we shall labor continually in the dark.

The essayist quoted from a New York writer, saying that quinine, salicylic acid, mercury and the iodides were the only remedies which had proven actually curative. I think his ideas are a little farfetched. I did not know that quinine, salicylic acid, mercury, or the iodides *were actually* curative. I know of no remedies that are actually curative. All remedies are used for the purpose of assisting the system to eliminate its poisons. I know of no drug that has cured a disease, and drugs are not used to cure disease, but to help the system to carry off its impurities.

The cold bath in typhoid fever is cited. Without doubt a great many deaths have been caused from overtreatment in typhoid fever. I remember very distinctly the case of my own father, who died of typhoid fever. He was a strong man with a good life-long family record. He laid in bed for nine days and the physician attending him did not have his bowels moved. This was about thirty-six years ago. When I think of it now it makes me shudder that such treatment could have been termed medical. He was given calomel and mercury and opium, whereas the use of water would have proven so very beneficial to him.

Another little incident along this line. I had typhoid fever once myself. My temperature was never allowed to go beyond 103°. There was very little medicine used in my case, and my

bowels were moved daily and regularly with water. The colon was flushed ; baths were given twice a day regularly, followed by rubbing and massage. This treatment was worth more than all the drugs combined.

We are getting to the point of trying to recognize more and more the cause of disease, then using simple things which will assist nature in carrying the patient beyond the critical period.

I take issue with the essayist regarding the cure of pyorrhœa alveolaris. He speaks freely of the work done by Dr. Younger. The method of Dr. Younger alone will not cure every case of pyorrhœa by any manner of means. I have had a large number of cases of this disease, in which I have resorted to Dr. Younger's treatment, and I have been pursuing it for a many of years, and while I cure a great many cases I must confess that I do not effect a cure by simply removing the granulations upon the roots. I have had cases where the teeth were loose and had to remove them after having removed every particle of deposit, finding them perfectly clean. There are some things in dentistry that we do not fully understand. I do not care to make the statement that the removal of the local cause of pyorrhœa is a specific, because it is not. There are systemic causes which predispose to pyorrhœa which need more than local treatment. It may be that there are hereditary causes, that some of the parents have been afflicted with the same disease. There may have been a gouty diathesis in some of the ancestors, and yet it might not show itself in this particular patient. It may take some other form. There may have been a rheumatic tendency which has come through the parent, and yet the child may not be rheumatic at all. We may have a condition predisposing to pyorrhœa that will not be cured simply by the removal of local causes.

Neuralgic conditions due to local causes, says the essayist, yield as by "magic" upon removal of the cause. I wish to enter my protest against such a broad statement. It is a great error on his part to make such a statement, for the reason that we find neuralgic conditions which prevail long after the local causes have been removed. You have had these conditions in your practice without doubt. The original cause has so affected the whole system that the trouble is not relieved after its removal. There are therefore other causes operating behind it.

I have here some calcific pulps taken from three molar teeth

in the mouth of my brother two or three months ago, the cause of which was no doubt persistent neuralgia. The case commenced early last June and was quite obscure. I tried almost everything to find out what the cause was. Finally the diagnosis was made by exclusion. Early in June my brother complained of neuralgia and I found a wisdom tooth with a slight cavity. I advised its removal, and at the same time there was a bicuspid with a nearly exposed pulp. I destroyed the pulp, treated it, got it in a good condition ready to fill, but he would not let me fill it. After a little time this bicuspid gave further pericemental trouble and I advised its removal because he would not let me treat it. The neuralgia continued and I could hardly tell what the trouble was. There was no tenderness on percussion, but I became convinced that there were possibly pulp nodules. In the two remaining molars we found complete calcification of the pulps, as you will see by the specimens. That did not remove the trouble, and we then removed the lower molar and found calcification in it. This did not stop the trouble and it continued. There may be still calcification in the main nerve tract. I cannot tell yet. The removal of the original cause in this case did not produce a healthy condition as by "magic." Not at all. There are other causes in this case which are undoubtedly contributing factors to the trouble. My brother has been an active business man, but for the last two years has been comparatively sedentary in habits. His appetite keeping up and his nutrition being good, he did not have sufficient exercise to carry off the impurities of the system, and these causes in his system may have produced this extra calcification which may go on and on. Neuralgic conditions therefore do not always yield as by "magic" upon the removal of the primary cause.

The essayist touched upon the subject of psycho-therapeutics. Here is a field which is just opening up to us. We do not appreciate it very much yet. I think five years from now we will appreciate the subject of psycho-therapeutics much more than we do to-day. This is a legitimate field for us to investigate. I shall not touch upon this subject further because I see in the audience Dr. Sudduth, who is an authority on this matter, and I am sure he will regale us with something of interest.

In closing, our essayist made the statement that the "fiction of yesterday is the truth of to-day, and fiction of to-day is the folly of to-morrow." If he had said that the *so-called* truth of to-

day would be the folly of to-morrow, I would accept it. Is it truth? So-called truth is not truth. Truth always stands. It does not change.

Dr. ELGIN MAWHINNEY: With reference to the use of systemic medication, I am happy to add my testimony to the fact that it is growing among the members of the dental profession. I have searched the literature of our profession very carefully and can find nothing that tells me anything about systemic medication for dental purposes. I have made inquiries among prescription clerks and druggists, and I find not more than 1 per cent of the dental profession ever write a prescription or ever have done so. I believe, however, that this 1 per cent is growing, and when we get a broader outlook and a better knowledge of things pertaining to the profession, we shall have greater need of it. It is not, however, through failure to understand the pathological conditions, nor the manner in which medicines act that we are using them more. We are beginning to realize that the parts upon which we operate bear a definite relation to the whole organism, and he who practices upon any part of the human economy without having a broad outlook and thorough understanding of it must indeed practice in a manner that should disturb his conscience.

Coming now to the question of curative agents spoken of by Dr. Bentley, I must confess I know of no drug that is actually curative. Nature does that work. The only thing we can do is to bring about a favorable condition for nature to do its work, and I think you will agree with me that this is the idea generally accepted by the medical profession.

We do not attempt to blunt the sensitiveness of the tubuli through the general system, but rather to quiet the perceptive centers and thus relieve the pain caused by mechanically irritating the tubuli.

I believe the essayist said, that by flushing the colon we mechanically remove the irritation. We do two things: We not only wash out the colon, but we stimulate cell activity. If he calls that mechanical, well and good. Cold or warm water will stimulate in the same way. If I take hot water into the stomach it will stimulate the peptic glands in the same way as if I took a mild irritant in the shape of what he calls medicine. I do not belong to the school that treats symptoms. If a man has nausea we must ascertain the cause of it. If it be the result of an irritant in the stom-

ach, we would not give another irritant with a view of relieving it. If it be the result of sluggish cell activity, then I administer a remedy to stimulate it. We want to be rational about all of these things.

The statement that opium has been relegated to the position of an anodyne is not correct. It has anodyne as well as other properties, and it is used largely for its other properties.

I shall be glad when the dental profession takes a broader view of general systemic medication. I am sure you are all interested in it. I have had some excellent results in preparing patients for painful operations from administering drugs. I do not care whether you prepare your patients by psychical, suggestive or other means. Sometimes I use drugs for this purpose, sometimes I do not; it largely depends upon the peculiarities or idiosyncrasies of the patient as to what I use. When a man declares that systemic medication has no place practically in the dental pharmacopœia, I must take issue with him, for I frequently use drugs and obtain good results from them.

Dr. W. X. SUDDUTH: This subject is very interesting to me, and I am pleased to see that it is being discussed before dental societies. The very fact that papers of this kind are being read before dental societies shows that the position taken by Dr. MaWhinney at a previous meeting of this Society, was largely the correct one. There is a golden mean in life to be reached in all directions, and it remains for medicine to reach it. Accurate diagnoses, based upon a thorough knowledge of pathology, which knowledge has largely for its foundation the work of Virchow, is the fundamental principle that is changing medical practice. The days of shotgun prescriptions have gone by; a thorough diagnosis, with the selection of the right alternative to effect a cure, is the basis of all intelligent and successful practice at the present time in medicine, and such should be the basis of dental practice. The essayist spoke of the use of remedial agents in dentistry, as well as in surgery. The surgeon has to resort to the use of certain drugs, and they have their place in the armamentarium of the surgeon just as much as the scalpel, saw and chisel. I think this golden mean is to be reached by an increased use of drugs in dentistry as it has been by a decreased use in medicine.

The point raised regarding the place that psycho-therapeutics holds in medicine and dentistry, I consider a good one. The

essayist spoke of certain enthusiasts who look upon psycho-therapeutics as a "cure-all." I do not happen to know many of that kind of psychologists among my associates. Those with whom I am best acquainted look upon psycho-therapeutics as having a definite place in medicine, and when accompanied by the selection of the right drug as an alterative, and preceded by a thorough and accurate diagnosis of the case, it, to my mind, represents the golden mean in medicine.

What has been said regarding nihilism existing in medicine is true. There is no question but what there is a growing discontent among the members of the profession, as to what has been accepted therapeutic measures in the past, and that a more rational way of selecting drugs and applying them is going to be adopted.

Natural remedies, so-called, were spoken of by the essayist, and by the way, I must compliment the author of the paper on his excellent and careful review of the present status of medical practice. Natural remedies should take a more prominent position in the future than they did in the past. The flushing of the system, the use of baths and electricity as stimulants and sedatives, those things that do not load down the system and put double work upon the eliminative organs, is the line of practice that is being accepted. I know of a reputable regular practitioner in this city who meets with most gratifying success in the treatment of his cases, and he carries all the drugs he uses in a little tin case in his vest pocket. When you come to understand the application of remedies in their fullness, you will find that there is not a specific drug for each disease. Take the drugs, for example, that were mentioned. They are not specifics; they are alteratives. An alterative is a drug that will arrest the progress of the disease and change the current, allowing nature to step in the breach and fill it. This is the line of medication that is and will be most generally adopted. Coming to the place that psycho-therapeutics holds in medicine, it is accredited as being a new line of practice, but it is not. From time immemorial the optimistic practitioner has been the successful one. I have never known a pessimistic physician to succeed in general practice. The practitioner must have faith in himself and faith in his remedies, and the man who has faith in himself and his remedies, and imparts it to his patients will be the successful general practitioner. Of course, this does not apply so much to surgery or to dentistry, as it does to general

medical practice. It is a point, however, that has been fully corroborated by many others.

The essayist spoke regarding the attention that is being paid to cellular pathology and cellular therapeutics. The secretion of an organ is simply the accumulated secretions of the individual cells that go to make up the organ. You cannot treat the organ as a whole; you have to treat it cellularly. Each individual cell has to assume its particular share of the remedy, whatever it is, and the result is due to individual cellular recuperation or change, which results in a change in the organ as a whole. I do not hold drugs have not a specific action, I do not mean their healing action, but that they have a certain direct action. If I give *veratrum viride* I expect to get a certain result; if I give *calomel* I get another result. There is not a drug whose action however cannot be duplicated by the operation of the human mind alone on the body. It is not necessary to give a "material" emetic in order to produce emesis. If you will excuse the expression, you can make a man throw up his boots by suggestion. It is not necessary to give a purgative in order to move the bowels. I have had patients who have found it difficult to get to the closet quick enough to empty the bowel simply from suggestion. It is not necessary to give a drug to lower the temperature, nor to control a fever. I have reduced a fever from 104° to 100° in fifteen minutes by suggestion. There are gentlemen sitting in this room who saw me lower the temperature of a patient 2° or 3° in less than fifteen minutes by suggestion. You can control the temperature by suggestion the same as with a drug, and by so doing you do not load the system with a poisonous drug that has to be eliminated.

Pulp nodules have been spoken of. I have never known them to do any harm except to produce pain, and by suggestion I can control pain. Dr. Bentley quoted an aphorism that I have used a great many times, and one that I used before this society two months ago, namely, that pain is not a condition *per se*, but the perception of an injury, and if you can shut off the perception of the injury you will have established a specific so far as the pain is concerned. If the injury itself is not followed by harm to the body at large, you have cured the injury in that way to a certain extent. You can put a man in such a condition as to refuse to perceive an injury. We have a great many conditions, and here I will take ex-

ception to the position taken by the essayist that "when you remove the cause you cure the pain as though by magic," and I want to second the stand taken by Dr. Pruyn, that there is such a thing as pain habit, and after the cause has been completely removed there may be a long continued neuralgic condition. I believe suggestion can be used with marked benefit in the treatment of chronic pericementitis and a great many of those chronic neuralgic troubles that remain as a result of an inflammation which has occurred at some time or other. I can place a patient in such a mental condition as to refuse to believe that he has pain. Sometimes when you have once treated the root of a tooth and filled it, because of a neuralgic condition there due to a sluggish pericementitis, you may have to open the tooth again with a view to relieving pain. Now, if you get the patient's mind off the condition for a certain length of time and use counterirritants upon the surface of the gum and mental suggestion as alterative, in this way you get the patient in a comfortable way of thinking about the condition of his tooth and give *vis medicatrix naturæ* a chance to restore a healthy condition in the parts. Such, to my mind, is the rationale of dental practice in the handling of such cases, provided of course you are certain that you have properly cleansed and filled the canals in the first instance.

Dr. J. N. CROUSE: I do not think the proposition advanced in the paper is new. As long as we have known anything about medicine there have been varieties of practice, and they will continue. As long as the human family is made up of a great variety of people, it is quite necessary that we should have varieties of practice. The operation of the mind of the physician on the mind of the patient is a most important feature, but there are cases where there is not much need of it, and in which I think it would be of no avail. We have to deal sometimes with a class of patients in which I have my doubts whether suggestion or anything else would stop the recurrence of pain in the course of ossification of the pulp. Pulp nodules is one form of ossification, but there is another form where the pulp cavity is filled up almost completely with bony matter—moulded, as it were, to the sides of the tooth. It is not fluid in consistence. When you have a case in which the nerves are impinged upon with increase of the deposit there, you have considerable pain. The pain will pass off when absorption takes place, and the deposit of bone has ceased for the time being and

the patient is comfortable. All at once, it will start up again. When you have a patient with the tooth filled with pulp nodules I have my doubts whether the condition can be relieved by suggestion. In some cases the pain is so intense that the patient is absolutely pale. It is one of the hardest things to diagnose. I have had a number of such cases come under my care, and I know what the symptoms and results are. I had a patient a short time ago, a woman, who had a tooth that was causing considerable trouble. The intervals of pain would last three or four minutes, at the end of which time she would feel as though nothing had happened except, perhaps, there was a little shock to the nervous system caused by the intense pain. In this case I made up my mind that there was a little periosteal inflammation, and in tapping the teeth I found that one tooth was a little more sensitive than the others and considered that it was the affected tooth. I drilled in and found the pulp cavity filled with ossific matter. By and by another tooth began to give trouble, and I had some suspicion as to whether this was the right tooth. When the patient was in my chair I found the tooth very soft, but the pain and soreness passed off within five minutes. I drilled into the pulp cavity and found the same condition. I have had several cases of ossifying pulp, and the trouble is not confined to one tooth, different teeth being involved. In the case cited by Dr. Pruyn, I expect it was another tooth in which ossification had taken place.

If I understand what hypnotism or suggestion (which is a new name for it) is, it is the power of mind of one person over another. I have seen this power carried to such an extent in the case of an individual that he imagined he was thrown across a room. He had to be held back. He was not in a rational frame of mind.

I was surprised to hear that opiates had been abandoned in peritonitis, and I have always thought that it was a good remedy to afford a patient rest and let nature do the best work she could. Of course, opium does not cure peritonitis, but it brings about a comfortable condition on the part of the patient while nature is relieving the inflammation.

Dr. W. X. SUDDUTH: With the permission of the society, I will try to give Dr. Crouse a little information upon two points, and one is that pain can be controlled by suggestion. I have at the present time a lady physician under my charge who is suffering from locomotor ataxia, and the lancinating pains in this disease

are perhaps the most intense from which a human being suffers. This lady controls herself completely by suggestion, and has done so for one or two months. She has not taken a single opiate or other remedy.

With reference to the relation of suggestion to hypnotism I will say that suggestion is simply one of the precursory stages of hypnotism. It is not necessary to carry suggestion to the hypnotic stage. Dr. Crouse also spoke of a man not being of rational mind when under the influence of hypnotism. I will say that there is great difference in opinion at the present time as to what that is. Opinions have changed considerably in the last few years, and what is considered irrational to-day may in the future be considered quite rational.

Dr. J. N. CROUSE: I realize the fact that I have not been able to get at the extent to which the different stages of hypnotism can be carried. The subject of hypnotism is not at all new. There is a well-authenticated case on record where a man hypnotized a wild beast which would have otherwise devoured him. I think on one occasion, by showing great firmness and positiveness, I prevented a man from sticking a pitchfork into me. The man was abusing a dog; I interfered, and he held up the pitchfork almost ready to stick it into me. I looked at him with such firmness and defiance that he soon dropped it. I am satisfied that if I had shown the least bit of timidity the man would have injured me with the pitchfork. He was absolutely mad at the time.

I stated once before to this society that I would encourage Christian science when it will do as much good as it did in the cases of some of my patients. Anything of that kind I am in for particularly when it is a good thing.

Dr. BENTLEY (closing the discussion): I got out of this affair a little easier than I originally contemplated. I knew full well that I would antagonize some of the set opinions concerning the subject of which I was to treat. I know further, that the thoughts I have uttered are not of mushroom growth. Above all other things, I do not wish to be classed among the fossils of the profession, and if there is anything in the vanguard of the profession that will benefit me professionally and my patients collaterally, I want it, and I am going to get it if it is the common property of the profession. Therefore, do not think that I am crystallizing because I have enunciated ideas here to-night that are a little different from

those generally held by the profession. On the other hand, I am far from crystallizing ; I try to keep myself in that plastic condition which will enable me to conform to any condition which is conducive to my professional welfare. The arguments that have been advanced do not disprove the tenets of the paper. Granting that medicines do not cure, for the sake of argument, and which may be considered a *lapsus lingue*, or a relative term, you are not attacking me, but are attacking the man who used it, Dr. Baruch, of New York, who is considered the high priest of advanced therapeutics to-day. It was he who used the words that quinine, salicylic acid, the iodides and mercury were the only medicinal agents that could be considered curative. I quoted him verbatim. We do know this, that we cannot judge of the effect of a drug given internally by the mechanical disturbance it produces. This is no way to judge of the potency of a drug. You have only got to consider the effect that it produces upon a certain portion of the body for which you are supposed to administer it. Because it produces a certain mechanical effect, or a certain disturbance, it does not of necessity give any particular value to the drug that you have administered.

In reference to the statements I made of Dr. Younger, I meant to have you infer that he successfully cures the large majority of cases he treats. Dr. Younger does not claim that he cures every case of pyorrhœa by his method. Those who have had an opportunity to see him operate know that he is exceptionally expert, and that he obtains excellent results.

I claimed in my paper that we are only treating symptoms. If pyorrhœa is a manifestation of a remote cause, call it what you will, I claim it is our duty to send such patients who are affected with it to a physician who treats these causes, after we have administered to the local manifestation.

With reference to neuralgias, and especially the case spoken of by Dr. Pruyn, my proposition is to remove the cause ; I should say in the case referred to by the doctor the cause had not been removed, and that if the cause were removed the effect would soon follow. Pain habit is a very important thing. Pain may be a condition of which we know nothing, but we have to treat all of these conditions. We have to treat neuralgias arising from various causes, and sometimes by removing the cause the symptoms disappear like magic. You may speak of pulp nodules being the

direct cause, but I question whether they are. When you remove a pulp nodule it may be the result of a remote cause.

To sum up my closing remarks, I am a firm believer in any remedy that will bridge over or act as a palliative in extreme conditions. I give Dr. MaWhinney the credit of having said what he did say *in extenso* in the paper that he presented at a previous meeting of the society regarding systemic medication. But no one, aside from Dr. MaWhinney, has said how or for what purpose he would use systemic medication. So far as I can see, you have not refuted the specific statements I have made in my paper.

THE ODONTOGRAPHIC SOCIETY OF CHICAGO.

The regular monthly meeting of the Odontographic Society was held in Room 1400 Reliance Building, Monday evening, March 9, 1896, the President, C. E. Meerhoff, in the chair.

Dr. L. A. EDWARDS then read a paper entitled "Artistic Effects in Crown and Bridge Work."

DISCUSSION.

Dr. F. R. ROSS: It seems to me, in listening to the paper, that the essayist has treated other forms of construction, perhaps, more extensively than the artistic idea and construction. Of course any of those who have been in practice any number of years have seen very many, and, perhaps, have constructed a good many anterior bridges. A great deal depends upon the manner in which a bridge is completed and is adjusted. If care is taken in cleaning the tooth or the root properly, thoroughly drying it, not merely rubbing off with a piece of sponge or cotton the secretion around it, but cleaning off with alcohol and hot air and then the cement put in proper condition, the bridge will undoubtedly give good satisfaction, provided that it is right mechanically.

From an artistic point of view, the most I can say is that pains should be taken in securing the proper shade of teeth, and then sometimes we may have a tooth that even when the backing is put on, with wax in the mouth, may be perfect in shade, but after soldering we find that the shade has changed somewhat and, as the essayist says, some dentist perhaps would not let that piece of work go out of his office, but I am afraid that a good many of us will be inclined to say, "Well, I guess that will do; it has changed

a little bit, but it was right when we began." I think I will have to plead guilty to that kind of conduct once or twice myself. Many times there are reasons for that. The patient may live at a distance, unable to come again, and your engagements are such that you cannot do otherwise than let it go, but that does not really excuse the operator of that kind of work. If he is honest, upright and intends to do for his patient the very best work, he will simply put it on temporarily, if that is the best he can do, and tell the patient it has to be done over again. The practice of putting on bridges with open face cusps is something that I have followed, and I do not know that I am ready to give it up entirely yet ; that is, by that I mean to say that I would not cut off a perfectly sound tooth and make a crown, necessarily, when I can put on a collar band and have it fitted properly and have the structure give good service. I know that a great many claim that that is particularly inartistic, and I admit that it is—that such work cannot be put on without more or less display of gold, but I do contend that those collar bands can be made to fit—that is more in point of construction. The crown of any of the anterior teeth which is constructed and put on so that it shows absolutely no gold is certainly more perfect from an artistic point of view than one making any display of gold, but I find in practice that it is not always possible to do that for two reasons. First, I have difficulty in getting my patient to submit always to doing just exactly what I think is best, and whether it is because I am inclined to be a little lenient and careful, rather than to be severe, I sometimes do put on a crown or a bridge in which there is more of a display of gold than I am gratified with the appearance of, but the work can be durable and cleanly and strong in that way.

Dr. SCHWARTZ: There were a few things said that I take issue with. While the paper was a very excellent one, and the gentleman who opened the discussion has talked very nicely about the paper and about his methods, yet there are a few things that I think have been overlooked in bridge work that are very important; that is, the loss of color in teeth. In the discussion on bridge work in one of the meetings not so very long ago, the fact was brought up about riveting teeth. I think that is one of the most reasonable ways of fastening teeth in bridge work, and there is absolutely no possibility of losing color when it is done that way, and the more a person cements teeth on and rivets them, the

more he will practice that method; and the liability of the tooth to break off is not so great, and if that should break off, then it is easier to fit the whole than to repair the bridge in the old method, and the method of repairing them has been always to drill through and fasten the pins without riveting them. It is much easier to recement a tooth, and put it in, than it would be to prepare the bridge in the mouth to do that.

So much for color in bridge work. There was something spoken about the artistic effects of the bridge work and open bands. I would not hesitate a moment to devitalize two good teeth, if I wanted to put on a good piece of work. I would just as soon cut the cusp off, even with the gum sound, and I would much rather do that than to destroy the beautiful contour here on an open-face point. To put on a piece of gold bridge work, I would much prefer to cut the tooth off and use the root for an abutment and restore the tooth to its normal appearance, and if you prepare a cusp as that is there, you would have to take the contours off of the tooth. If you took the contour off a tooth, it would not look at all artistic, and it would be almost impossible to attain an open-face band up there that will not show somewhat, and we will grant that it did not show and you do not particularly lose the contour, it would only be a question of time when the cement, to a certain extent, would work out, and that bridge would cut off the tooth if you did not. Consequently, the history of those cases, in 75 per cent, will bear me out in that statement, and no matter how well you adjust the band, how carefully you make them, they will look nice for a few years, and in exceptional cases do last a long time, but, as a rule, and I do not believe that any man will take issue with me, that the rule is that in nearly all cases those bands will cut off the tooth itself, and finally you lose the bridge and the tooth, and it necessitates making a new one. If you are going into the artistic part and the financial part both to the patient and yourself, I think the most conservative plan is, to take the tooth off and put on a piece of work; and I will say this about bridge work, that the more I see of porcelain work, the more thoroughly I am confirmed in the opinion that it is the correct work to do, and I do not hesitate to cut off two teeth, if I want to supply two cusps. I would much rather devitalize and cut them both off and put on a piece of bridge work than to fit a band close to the gum. It is said, you destroy the life

of the tooth. In a great many cases that come to you, there is no reason that you may not take a tooth that is in perfectly aseptic condition and treat it and put it in its proper state and put a bridge on in that way.

Dr. PROTHERO: The essayist made one statement that called to my mind a little incident that happened the other day in regard to the color of teeth. I had occasion to have a gentleman select a tooth, and he said to save his soul he could not tell blue from red. He is a student at the college, and I told him he had better quit studying dentistry right there, and I think that to a great extent is the cause of so much bridge work and crown work that we see off color. I think that a great many men are color blind to a certain extent; there are colors that they can distinguish and there are certain other colors that will not appear correct to them, and I think that will account to a great extent for the defective colors.

In regard to the devitalization of sound teeth, I feel that I am doing the patient more service and will do better work, that is more satisfactory work to myself, if I devitalize a sound tooth and place a crown on it than to attempt to band or put an open-faced crown on it. Situated as I am, I am compelled in many cases to put on open-faced crowns and to band teeth sometimes, but it is not because I think it is the best thing, it is because the patient either has not the ability or will insist on having that kind of work done, for one reason or another, or perhaps the work does not always come under my own supervision; but in my own practice I much prefer, and it will be more satisfactory to the patient I think. A perfectly fitted band, that is a crown built on a perfectly fitted band, will last longer than any other form of abutment that we can make.

I have had a little experience in porcelain work. Some of it has been satisfactory and some has been very unsatisfactory. I think that in a few years, from the number of men that are working at it now and from the experience that they must necessarily have and from the results that must necessarily follow from their investigation in the work, that porcelain is the coming work of the future. There is one trouble with it, and that is where the space is contracted or where we are limited as regards space, the work is liable to check where the stress of mastication comes on it, but that is overcome to a certain extent by using proper materials. Iridium platinum is very stiff and very rigid, and that can be used,

and by using a three or four cornered wire to strengthen the bridge or fetching that from one abutment to the other, we can in that way overcome the tendency to check to a great extent.

Then as far as the artistic appearance of a bridge constructed in that way is concerned, I think we can get better artistic results, because we can make a gum entirely to fill in the tissue that has been absorbed ; if we have very much absorption, a bridge put on the ordinary way will either show a tooth exceedingly long, or it will tip in and the tooth will not be in the normal position. So that, take it altogether, I think that in a great majority of cases we can get better results from bridges properly constructed of porcelain, not hesitating to devitalize sound teeth in order to get firm, solid abutments.

Dr. H. A. CROSS : The remarks made by the other speakers have had more to do with calling me to my feet than perhaps the essayist has. There was a thought expressed by one that he seemed compelled to build a piece of work a certain way to please the patient. I do not believe in that method of practice. I do not practice that method. I consider that my judgment is better than the patient's as to how the work shall be performed. I always take the lead in that. If there is a deficiency of money to pay for that work, some cheaper method might be adopted, but I will never put a gold band around a tooth to support a bridge. I have seen so much work of that kind that was a perfect failure, that I would not do it under any consideration. I have no confidence in the method; others might succeed, but I never saw a successful case of that kind.

I had particularly in mind as I came to the meeting to-night this thought. I am proud of the success of Chicago's successful dentists, of what they have accomplished. I do not believe there are any dentists in any other city in the world, that will beat Chicago on successful dentistry, but I do not think they have reached the highest plane of perfection yet. I am never satisfied with a bridge that is anchored to a Richmond crown, the gold showing at the gum line. I have so much faith in the skill of Chicago's successful dentists, I believe that that can be accomplished otherwise. I believe that the facing can be so adjusted that it will come in contact with the gum and hide the gold band, and at the occluding end that is also a blemish to my mind, but that cannot always be avoided. I have had occasion very lately this winter to remove

one of those beautiful bridges that was supported at the center and side with a gold shelled crown from over the center and side, in a lady's mouth. It was a young lady student at the Chicago University. The lateral incisor, or the bridge in it, had become loose and was tied with a string. The cuspid had an open band around to support the other end of this bridge; that was all loose and the cement had dissolved out and that was flying up like a foot in the mud, and removing this, you can imagine the condition. I put peroxide of hydrogen on for some time before I could inspect it, the occlusion of the tooth was such. I constructed a bridge, cutting off the central incisor and bicuspid and supplying the latter, that is, crowns were made, the Richmond crowns, and there is not any gold to be seen anywhere, unless you look at it from the lingual side and it is all gold, but there is absolutely no gold in sight and the work is very strong and substantial and gives great satisfaction.

Dr. W. H. TAGGART: The proper thing to do, of course, is always to commend the paper. It is a very excellent one, as it has brought out some remarks which I think will permit of discussion, and I wish right from the start to take issue with Dr. Ross with regard to his open-faced band. I have seen a great many of them, made by good and poor dentists, but I have yet to see the first one that ever fitted the root. I cannot imagine the condition being such as to make one fit. It does not seem to me that it is a question of the skill of the man; of course, a skillful operator would come nearer making it fit, but no matter what skill he may possess, it seems to me the mechanical difficulties to contend with are such that he could not overcome them. Of course, nature is very kind to us in making the gum cover up the most defective part of these open-faced bands, and when they are pushed up far enough under the gum so as to look reasonably well the gum has to cover up the part that is the greatest failure.

Dr. ROSS: If that gum keeps in a healthy, clean condition, what is the objection?

Dr. TAGGART: With a very elastic imagination, and stretching it to its limit, I can imagine the neck of an anterior tooth to be so formed as to cause no special irritation when accurately fitted with a band; but as I said before, I have never seen such a case, and as we have to build bridges as we meet them, we should

build them according to the rule and not according to the very small percentage of exceptions.

In regard to cutting off the crown, I do not know as I ever heard it expressed any better than, "if you do not cut it off the band will;" and I have got to see the first one that has not been injured, and I cannot imagine the condition being satisfactory when the amount of strain that is necessary to do the grinding is put on the bridge. Now, the strain that would naturally come on that open faced band would be greater than the strength of the cement, and there is no reason why it should not telescope over that root, keep moving up and down, and if you can get it to fit so well that that condition cannot take place, in order to do so you have mutilated the crown, and in mutilating the crown you have done a greater injury than benefit because in the near future that tooth will decay under the band in a way that will make it exceedingly difficult for any other man to put on even a Richmond faced crown. The ones I have seen, and that have been the greatest failures, have been very similar to the one Dr. Edwards speaks of, where there is nothing but the labial wall of the enamel, the band covering and hiding the very defective part. Of course, there might be exceptional cases, but I have not run across them, where these open face bands will prove a success; but I think the argument which Dr. Ross brings to bear in stating that his patients would not allow him to do this or to do that is all wrong. I do not believe he ever will be able to make his patients believe differently as long as he does not believe it himself. You cannot make anybody believe a thing unless you thoroughly believe it yourself, and then you can make the Old Nick himself believe it.

In regard to the point of remuneration for services, we are talking here about principles, not about costs. It is nothing against a method that it is expensive. I think in these discussions we ought to argue principles entirely, principles of construction, and then if you cannot bring your patients up to a belief that these principles are correct, do them some other grade of work that will make them only too glad to believe. We have been catering to the whim of the patient who comes in with ostrich feathers and velvets and says she cannot afford to have bridge work done, she wants an open-face band because she cannot afford a Richmond crown. She says it, wearing rings and patent leather boots. She is willing to take better care of her feet than she is of her mouth.

If you dismiss her, she will probably be mad, and she will go out and tell her story to some one else, but she will tell that story where it will fall on fertile soil; she will tell it to some patient who will say "I do not want a dentist who will give way to my will" and that patient comes to you and gives you a new case that will pay you three times as much as you lose on the other. So much for our principles. I think we ought to fight on that line, and not be continually compromising with patients and then regretting it.

In speaking of the strength of porcelain, I wish to draw attention to one rule which I have invariably made in doing porcelain bridge work, and that is to always put enough metal in the framework so as to withstand all the strain that can possibly be brought on it, and then add the porcelain for artistic effect. I never vary from this rule. In adding the porcelain for artistic effect, you will get additional strength. It makes it stronger, but rely on the porcelain entirely for artistic effect.

Dr. Prothero spoke of the advantage in porcelain work of being able to put porcelain gum where there was a great deal of absorption. That is a very satisfactory way of treating those cases where there is a great deal of absorption, but I wish to draw your attention to one thing that at first seemed to me was quite a nice feature in porcelain work, and that was to fill the V-shaped space between the necks of teeth with gum colored porcelain. Suppose we have two bicuspids placing them against the gum and then trying to fill that little V-shaped space which would represent the gingival margin of the gum, filling that with the pink porcelain, I thought was going to add very materially to the artistic effect, but I find in practice that it does not, for the reason that it looks as though there was a piece of tartar under the gum; it looks as if there was a broken or diseased gum and does not give the artistic effect desired, as it does where we have a great expanse of pink porcelain and see it in unbroken piece. If you do it in the back teeth for hygienic purposes, all right, but in the front teeth it does not show up as nicely in the mouth as it does in the piece when in your hand, so I advise you to steer clear of that error.

I was going to show you a piece of porcelain bridge work, but I have mislaid it. It represents a canine, which I cut off. The first bicuspid had been extracted, and the second bicuspid was worn down so that it was a little too short to give me the bite I wanted, so I cut that bicuspid off in order to open the bite sufficiently, and

back of them there were no teeth at all, so I made a saddle, putting small sized molars on the saddle.

I am quite certain, in seeing such specimens it would inspire the dentists to go on in the line of porcelain work. Of course the remarks about gold work and about soldering teeth, and losing color that way, and riveting teeth and saving the color, are all right as long as we are doing gold work, but we are coming to the time when the gold work will be in the background and the men who do the porcelain work will be in the band wagon, so that I would advise you all to go into the porcelain work, and it will pay in the satisfaction it gives you better than anything else I know of. You cannot afford to say to a patient coming in and asking you about porcelain work that it is not strong enough, that it is not a developed process. That talk will fall on the wrong kind of soil sometimes, because you will find that some other man with a little more aggressiveness will have had a talk with that patient and he will put in his mouth some porcelain bridge work that will last, because it is abundantly strong. I do think it is a stronger bridge than our porcelain face gold bridge ; it is not stronger than a bridge made with all gold crowns, but it is stronger, it will give more service in the mouth than nine out of ten of the porcelain faced bridges. Why, the reason the porcelain faces are the weak part of those bridges and are breaking off, is because they have nothing to retain them except the strength of the pins in the porcelain. Now then a porcelain crown, or a porcelain tooth fitted on a bridge is not only supported by its metallic framework, if you build it as I have said, but it has the additional strength in having all the parts of the facing reënforced and strengthened by the new porcelain which is added and baked to the frame, and I cannot figure it out any other way than that it is a stronger construction than the porcelain face can possibly be.

A MEMBER: Since you have mentioned the saddle on your bridge I would like to ask what is your experience with saddles generally?

Dr. TAGGART: I commenced with saddles, thinking possibly as most of the dentists do who have not used the saddle on bridges that a saddle meant the great expanse of metal in contact with the gum. Now, my idea of a saddle in porcelain work is that you do not get a bit of strength from the saddle, you do not get support from the saddle ; the saddle is only a matrix on which to build the

porcelain and a means of cleanliness. That sounds a little odd, because we have been arguing that the saddle is the uncleanly part of it. My rule is to make that saddle just wide enough on its seat on the gum to get rid of that self-cleansing space which we make on a gold bridge, that is what would represent the necks of molars, do not have the saddle wide enough to take in the full width of the molar, but have it narrowed up, so that there is a contracted neck toward the gums, not the shelving condition that we have when we have what we call self-cleansing spaces, and narrowing up the saddle to this width you certainly reduce that surface and you present less surface to become filthy than in having five or six self-cleansing ledges under there.

A MEMBER: Then you do not use your saddle as a matter of support at all?

Dr. TAGGART: No, I do not use them for a support. I think it would be a great mistake in getting the idea of using them as supports as long as you rely on a saddle to make an extension and have that saddle take the place of a good abutment, extending it say from the bicuspid back, so long your bridges will be failures. You have got to have abutments somewhere that will be able to stand the strain and using the saddle as the shape least calculated to accumulate food.

(Specimen on indicating.) That space is narrowed up to the width you remember our old-fashioned slate pencils, the little narrow slate pencils; now the saddle supporting those molars is not any wider than that, so you can easily see that is not intended to rest against the gum with sufficient surface exposed to help support it at all; it is only as a form on which you build porcelain to make it come entirely to the gum line.

A MEMBER: You have got two molars swung from a bicuspid?

Dr. TAGGART: From a cuspid and a second bicuspid.

A MEMBER: You have got two molars swung back of it?

Dr. TAGGART: Yes.

A MEMBER: Is that in a man's or woman's mouth?

Dr. TAGGART: That is in a woman's mouth.

A MEMBER: Do you think that would be sufficiently strong in a man's mouth?

Dr. TAGGART: Yes, for this reason: I have not explained to you, but in this particular case the lower teeth that are to strike

against these two molars are on a gold clasp plate, and the gold plate is comparatively rigid, for the reason that its clasps have the little lug extending over on the grinding surface, as advocated by our friend, Dr. Bonwill, which, when once seated is as far down as it will go, is almost as rigid as the bridge would be. Of course there is a little yield to it which would favor those two upper molars; if there had been good, solid molars in the jaw I would not have put in two full-fledged molars.

A MEMBER: You would not swing that in a man's mouth, would you?

Dr. TAGGART: Yes. For the reason that I have two abutments here. (Indicates.)

A MEMBER: But you would not get your abutments from the two molars, you would get them from the bicuspid?

Dr. TAGGART: Well, I get my support from the canine and second bicuspid. Here is your canine, which is a good solid tooth, and here is your second bicuspid, which is a good solid tooth; now then if these bands are made properly and if properly fitted with good strong pins in the roots, and this framework, cantilever like, is made of sufficient metal so that it cannot separate from itself I would not be at all afraid of it. I have two strong bars of No. 14 iridio-platinum, running from one end to the other and the additional strength of the porcelain. This insures strength enough in the bridge proper. Now then the proportions of the bridge are such that I have a greater length from the mesial surface of the canine to the distal surface of the second bicuspid than I have in my cantilever extension, consequently I have retained in my favor the long end of the lever which if we always succeed in doing we are reasonably sure of staying on top in the fight.

A MEMBER: Would you use that saddle in the ordinary gold bridges, the ordinary solder work?

Dr. TAGGART: No, for the reason that there are no materials that the gum takes so kindly to as to porcelain and platinum. The gum seems to take so kindly to the porcelain that it gets rid of all that irritation under the saddle that we would ordinarily expect under a gold bridge constructed exactly on the same lines. The difference in the two materials will make one a healthy condition and the other inflamed.

A MEMBER: Your saddle contact is a porcelain contact?

Dr. TAGGART: No sir, but the edge is porcelain. This sad-

dle bridge is placed on its abutments in the form of a skeleton, we have got the teeth soldered and the saddle swaged up, and then while in the mouth with broad, foot shaped pluggers I keep pressing those saddles, at every point where it don't make the gum white, I press it until it does make it white. When I get it so that it represents a good white line all around that saddle, I consider then that I have got the contact there. Now then, after that is worn for a few days, the gum turns up over that edge nicely and then comes in contact with the porcelain, and porcelain is so absolutely nonirritant to that gum tissue that it does not take on the inflamed condition that it would if it was gold, because there would be a tarnish of the gold, that would cause the inflammation around the margin.

A MEMBER: Would not the saddles give some support?

Dr. TAGGART: Well, my idea was not to rely on that for support; of course, get all you can from that source.

A MEMBER: As a matter of fact, you do get some support from the saddle.

Dr. TAGGART: Yes, but my idea is this, not to have the boys go out and get the idea that we are relying for support on a saddle; just as sure as you do that, you are going to fail in this work, but get what support you can from the gum there, let it do what it will, but do not rely on it for support. But it will have a great tendency to reduce the leverage. I have not had one of them spring yet. I put sufficient metal in my framework. But the porcelain without this rigid framework will break.

A MEMBER: Your idea in adjusting this so as to get that white line, you make your frame and adjust the frame after you have got it saddled and soldered together.

Dr. TAGGART: Yes, I do that on my model, and having soldered these teeth and run my bars through where I want them, then it is ready to try into the mouth and I push it up to its place, being sure that these caps are in place for they will always yield a little, so when you get it adjusted up to its place, when you take it off again and try to put it on your model it won't fit as it did when you took it off your model, showing a little change has been made. I find that I cannot work on my model any way to get this same perfection in fitting the saddle as I can do to it in the mouth. The platinum saddle will yield very readily, you would be surprised at how nicely it will push up at the different points.

A MEMBER: The saddle is pure platinum?

Dr. TAGGART: I use the pure platinum for the reason platinum and iridium in the saddle is most too resisting and in the thickness we use has not enough extra strength to add any additional strength to the bridge. It is too stiff and the number twenty-eight platinum would be as strong, possibly as stiff as far as actual strength is concerned, as number thirty iridio-platinum, which is about as thick as you would actually use it, but the platinum has the kid like softness that when you push it in place it stays there, which in fitting these saddles to the gum is a very desirable quality and is not possessed by the iridio platinum, which is too springy.

Dr. CROSS: There are gentlemen here who have not the proper confidence to deal with their patients, and I will cite an illustration in that line. There is a servant girl among my patients, earning perhaps ten dollars a month. She contracted \$125 worth of work with me, and she paid \$115 of that and there is no more work performed than what she actually paid for. That will give you one idea of how a man, if he has done proper work for his patients, will be prepared to bring his patient up to the right point.

Dr. EDWARDS: I do not know as there is very much left to say. In speaking of the cusp crowns, that it would be the best thing when you want something in one tooth, to cut off the same, would it be necessary there? Could you not make a strong pin in the root and retain the natural shape of the crown that way with so much less expense to your patient and making a much easier way of doing it?

About riveting the teeth on the bridges, I do not think there is any doubt but what it is a better way than soldering it on, but I think there is a little better way than that, the Bryant method. You can fit your fastenings to the bridge and attach a little nut there, polishing it off smoothly. Dr. Bentley asked a question about the bite. I think if Dr. Taggart would apply the same thing in a man's mouth, according to Dr. ———, it shows that most women bite harder than the men do, according to their weight and size. I do not think there is any doubt but what the porcelain bridge is the coming bridge, but I do not think that there are over half a dozen in the room that use it at present at all. There is no doubt but what it is the only bridge that is coming and probably will be the only bridge used.

Under the head of Incidents of Office Practice, Dr. Good said :

Dr. GOOD : I heard of a remedy Dr. Rogers told me of for a hæmorrhage which was new to me—antipyrin dissolved in warm water. His little son had pneumonia and he started to bleed at the nose about four o'clock in the morning and he had used all the old remedies without any effect and he said he had been reading in the journals about antipyrin and he just dropped half a grain into some warm water, put it in a syringe and put it into the boy's nose and it stopped it immediately. He said the nose did not bleed again until about five hours afterward and he used the same remedy again and it stopped it again.

The meeting then adjourned.

COMMENTS ON DENTAL EDUCATION.

In considering the question of medical education in the United States, the last report of the United States Commissioner of Education, says: "The professional courses which the students must follow bear a close analogy to those which the professors of our provincial schools have to take. The lectures, even at Philadelphia and New York hardly bear comparison with those of the faculties of Bordeaux and Nancy. In America there is nothing to be compared with the faculties of Lyons, and especially those of Paris. The theoretical courses are generally good, but elementary, the exercises in dissection are, as a rule, rudimentary. The practical work, except in chemistry, leaves also much to be desired. On the contrary, this is not the same with the dental schools, the triumphs of the United States." A high compliment is thus paid to the dental schools of this country.

At another point the report, in commenting on the ingenuity of Americans, says: "This practical sense is not only manifested by ingenious inventions destined to facilitate the life of all persons, and to make the fortune of the individual inventor. It is shown also in the creation of certain university specialities which we are not accustomed to see among the faculties, properly called thus, for instance, schools of dentistry and of agriculture. The last are of great service, especially in the districts where various crops are cultivated. The University of California possesses a model of this kind. This establishment undertakes the analysis of soils, indicates to those interested the species of plants best suited to different districts, and furnishes, gratuitously, the necessary seeds or grains. As to schools of dentistry, they exist in nearly all American universities; Harvard itself has one. That of Philadelphia is the most renowned on account of its practical method, the luxuriance of its installment, and the importance of its works. Twenty-two thousand patients are mentioned in its recent reports. The weight of gold employed reached six pounds. The instruction, which is very complete, constitutes a real faculty comprehending no less than seven distinct chairs. Students come from Europe and the Indies to take their degrees at Philadelphia, The Americans are the first dentists of the world." Just think of it! The luxuriance of installment, twenty-two thousand patients, and six pounds of gold!

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: A. W. HARLAN, M. D., D. D. S.

ASSOCIATE EDITORS:

THOS. E. WEEKS, D. D. S.

A. E. MOREY, PH. B., D. D. S.

THE ILLINOIS STATE DENTAL SOCIETY.

In looking over the programme of the above society you will find some subject which will interest you. The obvious thing to do is to mark off the four days of this meeting, beginning with the second Tuesday in May and go to Springfield. Every dentist in Illinois who desires to help the march of progress should go if it is possible to do so. The society needs new members, new blood, new interest. Be sure to go to the meeting prepared to stay the whole week. When you return home your clients will be benefited, you will be filled with new ambitions, new ideas, and you will resolve to add something to the stock of knowledge the coming year. Mark off the date.

THE BRIDGE CASE.

By reference to the decision, printed in full on another page, it will be seen that the case has been practically settled in favor of the Dental Protective Association of the United States. Dentists who have not already become members of this body would do well to join at once, as an encouragement to those who have so valorously fought this case to the apparent end.

It is very unlikely that the case will be reversed, even on appeal, as by the decision a new definition of what is patentable is made so clear that the case may be considered as final.

FOOD FOR THOUGHT.

Recently the Chicago Dental Society has been regaled with two papers on internal therapeutics—the first by Dr. E. MaWhinney, "Systemic Medication for Dental Purposes," and the second

by Dr. C. E. Bentley, on "To What Extent is Internal Medication a Necessity?" The papers themselves make very interesting reading matter, but they are not exhaustive treatises on this very dark field of dental practice. One is a glowing account of the various uses of many drugs for prevention of pain and the relief of conditions, and the other is a protest against therapeutics in general. It might be said that neither of the papers have struck the keynote of the place which drugs ought to or should fill in dental surgery.

It is easy enough to say many absurd things in a paper or a discussion, but it is not always easy to think that you are right in uttering such things.

The fact that experimental medicine must rest on a knowledge of biology and bacteriology should not deter experimenters from searching for antipyretics, antizymotics, or local anæsthetics. The basis of good health is nutrition and exercise, and the nearer the therapist gets to a removal of disease through such agencies the nearer he reaches the pedestal of eminence as a healer. The more or less irrelevant discussion of the above papers would seem to point to a necessity for the study of two or three "up-to-date" books on therapeutics, and at least one on bacteriology.

Let the merry war go on, our pages are open for protests, disquisitions, letters, burning thoughts, or a sensible, critical article on internal therapeutics as applied to the practice of dentistry and dental practice.

REVIEWS AND ABSTRACTS.

CATCHING'S COMPENDIUM OF PRACTICAL DENTISTRY FOR 1895. By B. H. CATCHING, D. D. S., Editor and Publisher, Atlanta, Ga. Pp. 318. Price, cloth, \$3.

Greatest and best of all the series. A new department added with the latest and best from the dental periodicals. The scientific department is to be admired for its conciseness. No library can be considered complete without this handy and excellent volume. We hope the editor will be rewarded by a large sale as his handiwork is to be seen on nearly every page. Many may think that the task of getting out such a book is a sinecure, but it is not as we know from much and varied experience in such work. Buy it and see for yourself.

ELECTRO-TECHNICAL SERIES. ELECTRICITY IN ELECTRO-THERAPEUTICS. By E. J. HOUSTON, Ph. D. and A. E. KENNELLY, Sc. D., New York: The W. J. Johnston Co. 1896. Price, cloth, \$1.

For the beginner in electro-therapeutics this is an admirable starter, and all the terms used are made easy and comprehensive to the tyro in electrical therapeutics.

This little volume is compressed into about 300 pages, and it is fully illustrated, so that one with only a smattering of the science will be able to make many of the appliances used in dental surgery. Electrolysis and cataphoresis are treated of in such a plain and simple manner that the dullest of us are made to see plainly what might a short while ago have seemed very mysterious. We heartily commend this book to students.

THE DENTAL COLLEGE SERIES OF TEXT-BOOKS. DENTAL CHEMISTRY AND METALLURGY. Fourth edition, revised, enlarged, and with many illustrations. By CLIFFORD MITCHELL, A. M., M. D. Chicago: The W. T. Keener Co., 1896. Pp. 586. Cloth, \$3.00.

In looking through this new edition we find many revisions and additions to chemistry and materia medica. The type is good and the text is clear. As a working companion in the laboratory we should think from an examination that it would prove to be of great value. There are many works on general chemistry too voluminous for the dental student's daily use. This book has not that fault. We cheerfully commend it to the practitioner as a work of reference which will prove to be of greater value than many strictly chemical works, because there is so much on alkalis, new remedies, their properties, etc., which cannot be found elsewhere without great labor and much loss of time.

THE BRIDGE CASE—DECISION OF THE COURT.

UNITED STATES CIRCUIT COURT, EASTERN DISTRICT OF NEW YORK.

INTERNATIONAL TOOTH CROWN CO.,	}	<i>In Equity.</i>
vs.		
ALLEN G. BENNETT.		

The bill alleges ownership by the plaintiff and infringement by the defendant of patent No. 238,940, dated March 15, 1881, and granted to James E. Low, for a method of permanently fixing artificial teeth to the mouth by bands around the natural teeth, in den-

tistry. The answer, among other things, denies knowledge, and prays strict proof of ownership; and sets up various anticipations.

At one place a certified copy forms the record of an assignment in the patent office was put in evidence taken on notice, but in absence of defendant's counsel. This is objected to now as insufficient. It would have been inadmissible on objection then; and perhaps have been suppressed on motion afterward (*American Cable Railway Co. vs. New York*, 60 Fed. Rep., 1016). But as it has been left as evidence in the case its inadmissibility has been waived; and on that waiver it seems to be sufficient.

The patent was before Wallace and Shipman, J. J., *International Tooth Crown Co. vs. Richmond*, in the Circuit Court for the District of Connecticut, 30 Fed. Rep., 775, and sustained. Of course everything decided there is to be considered as settled here.

The method is wholly mechanical, and is said now, in view of *Ridson vs. Medart*, 158 U. S., 68, decided since, not to be patentable; and defenses of prior knowledge and use by Doctor Day and by Doctor Beardsley, not before the court then, are relied upon now.

When the method, and not the operating parts, is what is invented, that, of course, is what is to be patented. Here the natural teeth belong to the wearer, and are to be operated upon; they are not made by the inventor to operate, and cannot be brought within the patent. The bands were not new in any sense alone; nor were they when combined with the artificial teeth merely; but the mode of attaching the artificial to the natural teeth permanently by the bands might have been; and, if so, that was what was invented, and what should be patented.

This method is thus described in the specifications:

"A band of gold, or other suitable metal, is first prepared and accurately fitted around the tooth adjacent to the vacant spaces to be supplied with an artificial tooth. This band is firmly secured in place by cement, which effectually excludes water or the fluids of the mouth, and is thus permanently attached to the tooth, so that it cannot be removed without an operation directly for that purpose. It is sometimes sufficient to prepare one of the adjacent teeth in this way; but generally it is desirable to prepare the adjacent teeth on each side of the vacant space. It will always be advisable to do so if the vacant place is to be occupied with more than one tooth.

"The formation of the mouth and the shapes and position of the teeth are so various with different individuals that my invention may require modification in various particulars in applying it. I, therefore, do not propose to limit myself to the details as shown, but consider that my invention includes the permanent attachment of artificial teeth by securing them to continuous bands permanently attached to adjoining teeth supported upon natural roots, and supporting said artificial teeth by said attachments without dependence upon the gum beneath said artificial teeth."

The claims are for:

"1. The herein described method of inserting and supporting artificial teeth, which consists in attaching said artificial teeth to continuous bands fitted and cemented to the adjoining permanent teeth, whereby said artificial teeth are supported by said permanent teeth without dependence upon the gum beneath.

"2. An artificial tooth cut away at the back, so as not to present any contact with the gum except along its front lower edge, and supported by rigid attachment to one or more adjoining permanent teeth, substantially as and for the purpose set forth."

This method, as such, would be as well practiced and shown by the attachment in that way of one side of one tooth or one end of a block of teeth, to one natural tooth, as by so attaching each side of the single artificial tooth, or each side of the block to a natural tooth. The method of the attachment to a natural tooth is, by the terms of the patent, precisely the same. A band extending upward so as to form a cap over the natural tooth would be none the less a continuing band of the patent when used as such in carrying out this method. The alleged infringement was done only by such use of such a cap. Doctor Day testifies to soldering a silver cusp to a silver band making a cap, which was permanently attached to a natural tooth of a patient, and to which an artificial tooth was attached. This testimony is supported by that of an assistant learning the profession, that of an intimate acquaintance of the patient, and the production in evidence of the work, kept after long wear.

Doctor Beardsley testifies to making a similar cap of gold and attaching it to a natural tooth of a patient, wife of a clergyman, and to attaching at first an artificial tooth at one side of the cap, and afterward another on the other side, which were worn, and gave satisfaction, several years. In this he is corroborated by an

assistant also learning the profession; and by the patient, her two daughters, and one of her Sunday school scholars. There is nothing so improbable about this testimony which is left wholly undisputed as to leave any fair doubt as to the occurrences, or their date, both of which preceded Low's invention. The method of either seems to be the method of the patent, and either seems to well have anticipated it.

Let a decree be entered dismissing the bill.

HOYT H. WHEELER.

JAMES C. CHAPIN,
EDWIN H. BROWN,

For Plaintiff.

CHARLES K. OFFIELD,
For Defendant.

DENTAL COLLEGE COMMENCEMENTS.

COLUMBIAN DENTAL COLLEGE.

The fourth Annual Session of the Columbian Dental College.—Graduates, 1896: M. J. Bell, Emma Berg, F. W. Bjorn, E. F. Brown, J. H. Dalbey, A. N. Dickenson, E. H. Dillon, J. E. Dunn, H. W. Goodarl, A. N. Hale, A. S. Hays, J. A. Huff, E. J. Lasagne, Annie M. Lund, J. A. McMaster, Julia E. Porter, Cora Rankin, W. L. Russell, E. L. Sawyer, C. A. Skalstadt, J. F. Steele, F. M. Williams, W. M. Williams, J. D. Wilson, H. B. Yonkey.

KANSAS CITY DENTAL COLLEGE.

Fourteenth Annual Commencement of the Kansas City Dental College.—Graduates, 1896: Ernest William Allison, Kansas; Philip Grant Brumbaugh, Kansas; Edwin Lee Burner, Kansas; Clarence Elmer Brown, B. S., Nebraska; Louis Merrick Breck, Kansas; Ernest Marvin Blakey, Missouri; Daniel Boone Baker, California; George Griffith Brock, Missouri; James Fritts Copeland, Kansas; Marshall Piper Davidson, Missouri; William Frank Driscoll, California; Henry Vampool Enloe, Missouri; Joseph Kimberlin Griffith, M. D., Missouri; George Frederick Hauser, Wisconsin; Henry Clay Heady, Missouri; Daniel Paul Harford, Missouri; Ed. Morrison Hiner, Kansas; William David Hall, Missouri; Charles Delavan Jackson, Nebraska; Frederic Clayton Kingsley, Kansas; Walter Estol Kendall, Kansas; George Philip Lux, Kansas; Robert Denton Lowrey, California; Leroy Wilburn Moore, California; Sidney Moss Major, Missouri; Edwin Arthur Morrow, Missouri; James Albert Morrow, Missouri; Edwin Adonijah Morgan, Missouri; Scott Roscoe Moore, Missouri; Harry Borden Maxfield, Iowa; Edward Clarence Morton, Kansas; Robert Lee Poplin, California; Vernon George Palmer, Iowa; Frank Joseph Pribil, Jr., Kansas; Frederick Franklin Pound, Missouri; Ira Alphonzo Roberts, Kansas; Robert Thomas Shaw, Kansas; David Newell Smith, Nebraska; Charles Victor Shoop, Missouri; Aretas R. Scott, Nebraska; Frederick Charles Stote, Kansas; Earle Dean Toler, Missouri; Jesse

Worrick Terwilliger, New York; Edmond Joseph Treyer, California; Charles Harrison Wikoff, Kansas; Charles Franklin Watkins, Missouri; William Campbell Young, Missouri.

CHICAGO COLLEGE OF DENTAL SURGERY.

Dental Department of Lake Forest University, The Fourteenth Annual Commencement, Tuesday, April 7, 1896 Graduates: John Emanuel Aigley, Edward John Allen, George Appel, Oro De Garmo Babcock, Augustus Bruce Bailey, Francis Albert Ballard, Charles Aldridge Banghart, Samuel George Barker, George Thomas Boon, Fred Coe Bradner, Samuel Edgerton Burke, William G. Burkhardt, George Henry Bush, Albert Otto Boehmer, Reuben Cleveland Brophy, M. D., William Thomas Bell, William Francis Bevan, Aksel Trygve Boyesen, Edward Francis Caldwell, Louis Phillip Cardwell, Russell Vaughan Cleveland, John Hiram Conant, John Henry Cunningham, Frederick Allen Crookshank, Herbert Jesse Calkins, Charles Treat Chandler, John Truman Carpenter, David St. Idloes Davies, Charles Chidsey Devereaux, John Burgess Dicus, B. S., A. B., James Dodd, B. S., William Paul Deurre, William Henry Dunn, Charles Clifford Dutton, Albert E. Eberhart, Timothy Alexander Egan, Jerome William Egbert, George Eggers, Joseph Eggers, Charles John Fahsel, John Mather Falvey, Owen Lincoln Frazee, John Franklin Fribley, Clyde Caldwell Fergusson, Edward H. Goodsell, Matthew L. Gregerson, William Sidney Griffiths, Jr., Augustus D. Groshon, Daniel Jonathan Francis Hager, Arthur Brentom Howatt, Frederick Martin Heiden, Ashley Myron Hewett, Fred J. Holt, Robert J. Hood, Charles Hovey Hurlbut, George Edwin Huwatchek, George Hulla, George Wellington Johnson, George Victor Kohn, Othello Lasley Kerr, Carl Klein, Jr., Floyd C. Lander, Clayton Oswald Letourneau, John Andrew Locheed, William Hoffman Gardiner Logan, Frank Stanley Lombard, Roderic Savanna Maloney, Benjamin Franklin Martin, Archibald McArthur, Hugh William McMillan, James Duncan McMillan, George Henry Madill, Charles Sumner Methven, Cornelius Joseph Murphy, Edward Joseph Murray, Neil P. Nelson, Ingvald Nesheim, Sheldon Peck, George Washington Pitts, L. G. A. Powell, Michael John Prendergast, William Augustus Quinn, Wilbert Clinton Reid, Frederick Walter Rose, Alvah Isome Sargent, Howard Lyle Simmons, Frank Leslie Smith, Claud Harry Snashall, Frank Ford Snedecor, LeRoy Snowden, James Holm Steele, Frederick William Stephan, Albert Bennie Stiles, John Augustus Stoeckley, Alvin Grant Sturtz, William Lewis Selsor, Gilbert Robert Tait, Rowan James Talpey, Mark William Trude, Edwin Howard Varnum, John Robert Watt, Frank Arthur Weld, Marshall Grant Wheeler, Nelson Beall Winter, Charles Lewis Wyeth.

INDIANA DENTAL COLLEGE.

The Seventeenth Annual Commencement of the Indiana Dental College, Tuesday, March 24, 1896. Graduates: B. M. Ackman, P. D. Ballou, Jennie H. Becker, T. T. Brand, L. R. Booze, J. Q. Byram, R. M. Callaway, O. C. Carr, F. B. Cochrane, G. R. Conover, R. E. Culver, B. H. Edwards, A. F. Eiteljorg, W. M. Ellison, M. M. Gilbert, E. G. Glasgo, J. R. Harrington, Sara Harris, W. F. Huddle, E. S. Hunt, R. M. John, E. H. Kreis, W. M. Kunkle, M. E. Little, H. T. Locy, H. R. Martin, E. S. Miller, H. B. M. Nutt, Hiram Porter, E. G.

Prall, T. C. Rutledge, W. P. Shortridge, M. V. Smith, J. W. Vance, C. C. Van Scoyoc, J. C. Vaughn, R. S. Viberg, W. E. Walker, H. D. Weller, G. N. Wickwire, V. V. Williams, T. J. Wilson.

AMERICAN COLLEGE OF DENTAL SURGERY—DENTAL DEPARTMENT OF THE
NORTHWESTERN UNIVERSITY.

Graduates: Will O. Asseln, William G. Andrews, F. S. Anable, William Miller Ash, Walter Runnells Adams, Fred L. Axtell, J. L. Boynton, J. A. Birchard, Carl S. Byrnes, Joseph Michael Bischoff, A. T. Baxter, Geo M. Berry, F. H. Bigness, H. A. Bear, Jno. P. Brunton, Edward J. Berg, Charles Ellis Bartholf, F. H. Blaschka, James W. Birkland, A. G. Bauer, Ellis R. Boston, Polk Huntingdon Brown, J. Truman Clark, William M. Choate, Marcus H. Cox, W. E. Carr, Henrietta Christiansen, E. E. Cherington, Geo. M. Dott, A. John Davis, James E. Dale, Marie Erickson, Francis J. Freeman, W. O. Fellman, G. H. Frey, W. J. Ferguson, Arthur Paul Fillastre, Harry J. Feltus, Jas. R. Goodrich, Samuel L. Gants, Peter Gibson, D. C. S. Garver, J. C. Gardiner, L. Harrison Grove, W. B. Graham, Ray M. Gibbs, L. O. Green, Sara Conklin Gramm, Mary Maloy Hawley, Fredrick W. Heineman, Geo. S. Hilliard, W. B. Hall, E. V. Harvey, Jacob C. Hay, I. B. Howell, E. O. Haese, C. W. Hoffman, F. M. Hole, John C. Hamill, Charles H. Jordan, L. E. James, J. J. Jackson, Sam. Jessup, D. J. Kuns, Bert H. Kershaw, C. L. Kinney Anna Marie Kirkeberg, Howard Hersey Kellogg, Herman Keüchler, C. Lincoln Lind, Duchamp Charles Labbè, Chas. J. Lyons, G. D. Libby, J. M. Lower, M. D., H. E. Macdonald, J. Laurence Morris, H. H. Maynard, Arthur J. Mears, Ida L. Menges, J. K. Means, John McDermid, Alfred D. McCabe, F. E. McCarty, H. N. McDowell, B. S., R. Napier, Murray Lee Ong, M. L. Opheim, B. S., E. R. Perkins, Donald Lucas Phillips, D. W. Pratt, Samuel Hale Potter, A. A. Petersen, Ph. G., A. D. Ratcliff, Francis G. Richardson, G. H. Rollins, J. H. Reid, Anson F. Poley, C. R. Leidig, A. B. Clark, A. W. Head, Frank Alexander Ross, Earle H. Reaugh, J. W. Smith, Louis J. Smith, O. E. Simpson, P. D. Silvernail, Charles E. Stutenroth, Albert Stroebe, H. H. Straith, Wilber E. Sackett, Edgar C. Severns, M. V. Secrist, H. C. Spengler, T. G. Thompson, S. A. Turpin, L. L. Whitson, Geo. E. Wasser, S. V. Weiser, Clem White, Clark M. Wilson, Louis M. Williams, Harry Alexander Ware, L. D. Woltzen, G. O. Whitwam, Arthur E. Young, Edmund L. Yard, A. O. Yearian, A. E. Younkin, F. B. Young, J. E. Zipf, Emanuel Z. Ziperman.

DENTAL DEPARTMENT OF THE STATE UNIVERSITY OF IOWA.

Class of 1896.—Marshall Brooks Ayers, Davenport, Iowa; John Patrick Brennan, Bathgate, N. D.; Clarence P. Bevan, Malcolm, Iowa; William Henry Batchler, Toledo, Iowa; Leon Leota Branson, West Branch, Iowa; Besse Starr Casebeer, Tipton, Iowa; Peter Francis Dempsey, Lansing, Iowa; George W. Eshelman, Arlington, Iowa; Thomas George Ferreby, Marion, Iowa; Samuel Franklin Heverly, Center Point, Iowa; Richard Eddy Kidder, Iowa City, Iowa; Norval Knight, Burlington, Iowa; Herbert Nathan Kelley, Wilton Junction, Iowa; Ira Daniel Lutz, Mt. Morris, Ill.; Charles Ball Lewis, Ottumwa, Iowa; Friend Clyde Leslie, Iowa City, Iowa; Leon Mead, Cambridgeboro, Pa.; William Arnold Meis, Worthington, Iowa; Leah Mills,

Perry, Ill.; Berton Atwood Miller, Newton, Iowa; Otis Maitland Newman, York, Neb.; Leon Leroy Poston, West Liberty, Iowa; Claude Oppie Pingrey, Cherokee, Iowa; Fred A. Roe, Madrid, Iowa; William Arnold Reque, Spring Grove, Minn.; Ray Elwell Sharp, West Superior, Wis.; Walter Stanford, Cambridgeboro, Pa.; William Edwin Sauls, York, Neb.; Winfred E. Tubbs, Maquoketa, Iowa; Harry A. Tobie, Colesburg, Iowa; Forrest Giles Webber, Cherokee, Iowa; Hugo Westhofen, Milwaukee, Wis.; Herbert Henry White, Winthrop, Iowa. Matriculates, 218, 1895-1896.

MEMORANDA.

Dr. E. H. Allen, of Freeport, visited Chicago in March.

Dr. A. J. Richter, of Milwaukee, was a recent visitor in Chicago.

Do you use formalin? Is it a good preservative? What strength gives best results? Will it mummify a pulp?

Do you like papaine? We have used it to digest pulps with good results. Use it in a paste with sterilized water and seal the cavity for three days.

Drs. Haskell & Markle have removed to the Columbus Memorial Building, 103 State Street. Also the Haskell Post-Graduate School of Prosthetic Dentistry.

The Western Reserve University, of Cleveland, Ohio, is soon to have a new building for its dental department. It will be large enough to accommodate nearly two hundred students.

The Iowa State Dental Society will meet at Marshalltown, Iowa, Tuesday, May 5 to 8 inclusive. A good programme has been issued. Members of the profession are invited to be present.

The Oklahoma Dental Association will meet at Oklahoma City Tuesday and Wednesday, May 5 and 6. A good programme has been issued. Members of the profession are invited to be present from other States.

Dr. S. B. Hartman, of Fort Wayne, Ind., recently lectured on the "Teeth" to the pupils of the Hoagland School in that city. His lecture was well received. Fort Wayne is taking an enviable position in the education of the public in dental matters.

A SATISFACTORY FILLING.

TRAMP—At dentist's door—"Please, sir, could yer fill me teeth this morning?"

DENTIST—"With silver or gold?"

TRAMP—"Cold roast turkey would do."—Up-to-date.

The second annual meeting of the Southern Wisconsin Dental Society will meet at Platteville, Wis., on the first Wednesday and Thursday of May, 1896. All legally qualified dentists of the States are eligible to membership.

R. R. POWELL, D. D. S., *President*, Janesville.

J. H. REED, D. D. S., *Secretary*, Lancaster, Wis.

Dr. A. O. Hunt, of Iowa City, was a visitor to Chicago early in April. The dental department of the University of Iowa will begin the lengthened term this

fall. Three years of nine months each. Michigan, California, Harvard, Boston Dental College, Iowa and Minnesota each have full college years. Two or three of the university colleges now have eight months' sessions; why not make it nine?

OFFICERS OF THE CHICAGO DENTAL SOCIETY FOR 1896.

President, Louis Ottofy; First Vice President, J. E. Hinkins; Second Vice President, H. A. Costner; Recording Secretary, A. H. Peck; Corresponding Secretary, George B. Perry; Treasurer, E. D. Swain; Librarian, H. Alfred Gunther; Executive Committee, George H. Cushing, to succeed himself; Board of Censors, George T. Carpenter, B. D. Wikoff and George W. Schwartz.

TO ABORT A COLD.

At the beginning of an ordinary cold, relief is frequently obtained by taking:

R Sodii Salicylat..... 2 drachms.
 Spirit. Ammon, Aromat..... 1 ounce,
 Syrup Aurantii q s..... 2 ounces.

M. Sig.: One teaspoonful every four hours.—*Practitioner.*

A PAINLESS VESICANT.

R Menthol..... 1 part.
 Chloral Hydrate..... 1 part.
 Cacao Butter..... 2 parts.
 Spermaceti..... 4 parts.

M. Make into an ointment and spread on lint or adhesive plaster.—
Il Farmacista Italiano.

PAINLESS TOOTH EXTRACTION.

R Oil Wintergreen..... 2 drachms.
 Chloroform..... 1 drachm.
 Sulphuric Ether..... 1 drachm.
 Chloral Hydrat..... 2 drachms.
 Oil of Cloves..... 4 drachms.
 Alcohol..... 12 drachms.

M. Apply with cotton, pressed on each side of the tooth.—*Medical Standard.*

NEW DENTAL SOCIETY IN LOUISVILLE.

TO THE EDITOR OF THE DENTAL REVIEW:

Dear Sir:—At a gathering of the younger members of the dental profession in this city during the latter part of 1895, it was after some discussion, considered advisable to form a local society for the encouragement of social and professional advancement. As a result the Louisville Odontological Society was inaugurated and meets the first Saturday of each month. The interest and benefit from these meetings has been marked from the start. The next meeting will be with Dr. J. H. Harrington at the Kenton Club, the first Saturday in April.

The following officers were elected: Dr. W. E. Grant, President; Dr. M. M. Eble, Vice President; Dr. C. R. Shacklette, Secretary-Treasurer.

C. R. SHACKLETTE, *Secretary*

THE ILLINOIS STATE DENTAL SOCIETY.

The thirty-second annual meeting of the Illinois State Dental Society will be held in the Senate Chamber, Springfield, Ill., May 12 to 15, 1896. The Executive Committee has been especially fortunate in preparing a very interesting program. No member can afford to be absent. Dentists practicing in the State are cordially invited to attend, and if possible to become members of the Society. The profession outside of the State is always welcome at these meetings. The hotels and railroads have granted the usual reduction. Pay full fare in coming and take receipt therefor, this when countersigned by the Secretary entitles the holder to return for one-third the usual fare.

LOUIS OTTOFY, *Secretary*,

Masonic Temple, Chicago.

FORMALIN IN DENTISTRY.

Lepkowski announces in the *Przegląd Lek.*, 1895, Nos. 20 and 22, that he has found formalin very effective in cases of acute pulpitis, when even after the tooth has been filled the pain ceases in a few hours. Also, after extraction of the sound pulp, in cases of incipient periostitis, and where the pulp is changed into an ichorous mass. He first cleans the tooth as perfectly as possible and then introduces a cotton wad dipped in formalin, which he covers with a staniol plate, on top of which he puts the complete filling. A moderate pain follows for several hours, if the nerve has not been entirely killed. Formaldehyd kills the sound pulp completely, with no greater pain than accompanies the use of arsenic paste, with this advantage, that the tooth can be filled at once, without further cleaning. He hopes that this treatment will be found all that he expects from it at present.—*Centralblatt f. Chir.*, Feb. 8.

TO THE EDITOR OF THE DENTAL REVIEW.

The following is an extract copied from the Otago (New Zealand) *Daily Times* of February 4, from the proceedings of the Intercolonial Medical Congress:

DENTAL SECTION.

"The President mooted the desirability of adding a dental section to the congress.

"Dr. Springthorpe (Melbourne) as a member of the Dental Board of Victoria remarked that it was partly with the idea of raising the status of dentistry that the proposal for the addition of a dental section was made. Nothing could, however, be done now, and perhaps the best thing would be to instruct the next congress to take up some actual action in the matter." He moved—"That the question of the establishment of a dental section be transmitted to the executive committee of the next congress with power to take action in the matter."

"Dr. Knaggs (Sydney) seconded the motion.

"D O'Hare (Melbourne) thought it would be an advantage not only to dentists in raising their standard, but also to the profession generally if dentists were admitted to the congress as a section. He thought, however, that dentists should be brought to a certain standard before being admitted.

"The motion was carried without dissent."

With kind regards,

Sincerely yours,

A BURNE.

SHOULD DENTISTRY BE TAUGHT IN THE SCHOOLS?

NEW YORK, March 24.

TO THE EDITOR OF THE SUN.

Sir.—If dentistry were taught in the schools, *i. e.*, that part of it which relates to the care of the teeth, their gross anatomy, the first and second dentition, some of their principal diseases, such as caries or decay, abscess, and so forth, there would be some hope that the girls so taught, when they grow up and bring their children to a dentist, would know that there were thirty-two teeth in an adult's head, against only twenty baby teeth. Then, bringing their arithmetic to bear upon the subject, they might be able to see that there were twelve teeth that could not have had any predecessors.

This much accomplished, a mother would not exclaim, when told by the dentist that the "first" or "sixth year molar" was a permanent tooth, "Oh, no, Doctor, I'm sure that's one of his first teeth." The fond mother who really "intends to have all of Johnny's second teeth filled," will allow these four "sixth year molars" to decay past saving, thinking they were deciduous or baby teeth, because they were the first ones in that place, and the category might be indefinitely lengthened.

I do not, of course, contend that anything about dentistry except the most simple rules of hygiene and the most important facts about the natural teeth should be taught, and that in connection with the physiology and hygiene already taught.

There is no reason why a child should not learn the names of the teeth, and that correctly. Cuspid tooth is no harder than the incorrect one of "eye" or "stomach" tooth, especially if at the same time he learns that cusp means a point or spear. Bicuspid (two points) will readily follow.

And with the going out of these foolish names I hope will go out the absurd idea that the above mentioned organs, eye and stomach, are in any way affected by the extraction of the cuspid teeth.

It should also be taught the child that the teeth are a God-given part of him, made primarily for use and not for looks only, and that thorough mastication is a necessity to good digestion. If this were done young people would not allow their "back" teeth to go to ruin and take care of their front ones only, a thing sure to be regretted in after years, especially in public speakers or singers. "If I had only known in time" is a far too common lamentation in this enlightened age.

Once let it be known that such teaching is desirable and the question of "Text-book" will be easily answered. In the first place, none is needed, but only a chapter or two added to the book on physiology and hygiene already in use, and that chapter prepared or endorsed by a leading dental society rather than by any one man.—D. D. S., *New York Sun*.

THE THIRTY-SECOND ANNUAL MEETING OF THE ILLINOIS STATE DENTAL SOCIETY
AT SPRINGFIELD, MAY 12 TO 15, 1896.

The following is the programme as far as completed at the present time :

Report of Committee on Dental Science and Literature. Dr. A. W. Harlan, Chicago.

Report of Committee on Dental Art and Invention. Dr. Geo. J. Dennis, Chicago.

Report of Committee on Necrology. Dr. C. B. Rohland, Alton.

Annual Address by the President. Dr. W. A. Stevens, Chicago.

PAPERS.

New Outlooks in Dentistry. Dr. C. E. Bentley, Chicago.

Shock. Dr. Garrett Newkirk, Chicago. Discussion opened by Dr. C. N. Johnson, Chicago.

Early Diagnosis of Malignant Tumors of the Mouth. Dr. H. H. Schuhmann, Chicago. Discussion opened by Dr. C. P. Pruyn, Chicago.

Cervical Margins. Dr. J. Austin Dunn, Chicago. Discussion opened by Dr. G. H. Cushing, Chicago.

New Method for Constructing Bicuspid Band Crowns with Porcelain Cusps and Facings. Dr. B. J. Cigrand, Chicago.

In addition to this, Dr. G. V. Black, of Jacksonville, will make a practical test of the expansion, contraction and density of amalgam. This will be a unique feature of the meeting.

On the first day thirty steel tubes will be filled by as many different operators, using different amalgams, and on the third day of the meeting every tube will be subjected to the same tests. This will be done before the society, and the report made as the tests proceed.

Should there be time, the subjects suggested by the American Dental Association will be taken up and discussed.

The clinic programme is in course of preparation.

CLINICS.

1. "Step" filling central insisor, R. Rayburn, Fairbury.
2. Filling crown cavity, equal parts No. 4 gold and tin foil, A. S. Waltz, Decatur.
3. Continuous gum case in the Custer Furnace, George J. Dennis, Chicago.
4. Pyorrhœa Alveolaris, A. W. Harlan, Chicago.
5. Making and tempering dental instruments with a few special forms of his own, Garrett, Newkirk, Chicago.
6. Porcelain crown, using Downey Furnace, B. Newsome, Minonk.
7. Filling approximal cavities of the anterior teeth without previous preparation or separation, G. W. Thompson, Quincy.
8. Demonstration of the use of compressed air at the operating chair, J. W. Wassall, Chicago.
9. Oral surgery, J. S. Marshall, Chicago.
10. Gold filling with Bonwill Mechanical Mallet No. 2, using Fellowship foil No. 60, A. W. McCandless, Chicago.
11. A new and accurate method of fitting bands to roots, especially applicable to those roots that are badly broken down and difficult of access, W. H. Taggart, Chicago.
12. An artistic and permanent method of attaching small bridges, Arthur G. Smith, D. M. D., Peoria.
13. New method for producing bicuspid band crowns with porcelain facings and cusps, B. J. Cigrand, Chicago.
14. Porcelain face bicuspid crown, all soldering done with a Bunsen burner; no investment, A. H. Peck, Chicago.
15. Method of using tin and gold combined as a filling material, E. M. Robbins, Carthage.

16. Preparation and filling of a proximal incisor "step" cavity, J. H. Prothro, Chicago.

Models or descriptions of inventions during the year of articles pertaining to dentistry are requested by the Committee on Dental Art and Mechanism to be sent in as early as possible, that a full report may be made in the regular order of the programme.

Models or instruments will be cared for, exhibited to the society, and returned to owner after the meeting, when accompanied by cost of transportation.

GEO J. DENNIS, *Committee.*

Thirty-first Street and Michigan Avenue, Chicago.

A cordial invitation is extended to all reputable practitioners, whether resident in the State or not. The society is always pleased to welcome visitors.

The railroads will give a rate of a fare and a third for the round trip upon the "Certificate Plan." In order to get this reduction, full fare must be paid in going to the meeting, a receipt being obtained therefor from the ticket agent at the starting point. If traveling over more than one line named below, secure a certificate over each line. This receipt (certificate) must be countersigned by the secretary of the society, and entitles the holder to return for one-third fare, provided that one hundred certificates are presented, showing that at least that number have paid full fare on the various railroad lines entering the place where the meeting is held. The usual reduction in hotel rates has been granted.

THE INFILTRATION METHOD OF ANÆSTHESIA (SCHLEICH'S).

The following are the solutions advised by Schleich (quoted by Wurdemann in the *Journal of the American Medical Association*, November 16, 1895) in the performance of his cutaneous infiltration:

Solution No. 1, Strong—for operation upon highly inflamed or hyperæsthetic areas:

℞ Cocain mur. gr. j.
 Morph. mur. gr. ⅛.
 Natr. chlor. gr. j.
 Aq. dest. ad fʒj.
 M. Sterilisat. adde sol. ac. carbol. 5 per cent, gtt. ij.

Solution No. 2, Medium—for most operations:

℞ Cocain. mur. gr. ss.
 Morph. mur. gr. ⅛.
 Natr. chlor. gr. j.
 Aq. dest. fʒj.
 M. Sterilisat. adde sol. ac. carbol. 5 per cent, gtt. ij.

Solution No. 3, Weak—for superficial operations upon early normal tissues:

℞ Cocain. mur. gr. 1-20.
 Morph. mur. gr. 1-40.
 Natr. chlor. gr. j.
 Aq. dest. ad fʒj.
 M. Sterilisat. adde sol. ac. carbol. 5 per cent, gtt. ij.

The keeping qualities of these solutions are improved by the addition of three drops of trikresol to each prescription. Tablets, triturates and compressed tab-

lets are made of these solutions by Parke, Davis & Co. of such strength that one should be dissolved in three ounces of boiled water.

The technique of the operation is as follows: The field of operation is made aseptic in the usual manner. Having the required formula, the solution aseptic and cold, we fill the sterilized hypodermic syringe; pinching the skin slightly between the thumb and forefinger of the left hand, the needle is then passed obliquely under the epidermis to the papillæ, intracutaneously, until the lumen is fully inserted. A few drops are then injected, thereby producing a white elevated wheal, the infiltration extending throughout the whole thickness of the skin. There is immediate and complete anæsthesia throughout the extent of the infiltration, which lasts from ten to twenty minutes according to the density of the tissue so edematized. The needle is then reinserted, at the periphery of the wheal, and the area infiltrated to the required extent and depth. No tissue offers any deviation from the dictum. Every structure is made anæsthetic that can be artificially edematized; this holds good for skin, mucous and synovial membrane, periosteum, fascia, muscle, lymph glands, nerves, viscera, and even bone.

Anæsthesia exists only within the area infiltrated by the solution; outside of that, normal sensation remains. In operations requiring extensive division of the skin and mucous membranes the first wheal is increased to the size of a dime by increased pressure on the piston, and the needle is then removed and reinserted at the periphery of the wheal, but still within it, and a new wheal raised. In this way the line of incision is marked out to any desired length or breadth. In general surgical operations we would then infiltrate the underlying tissues, by slowly pushing in the needle and injecting a few drops at a time until the deeper tissue is edematized.

By cooling the spot selected for the formation of the first wheal by ether or rhigolene spray, or on mucous membranes by touching the spot with a strong solution of carbolic acid or applying cocaine, the first injection may be made, if so desired, without even feeling the prick of the needle. This is seldom necessary, as a very fine needle may be inserted without pain even in very tender tissues, such as the eyelids. The succeeding injections may now be made without causing sensation. There is no sensation to the infiltration proper.

Where the tissues are inflamed, the sensibility is pathologically increased. Here it is indispensable that the infiltration be begun in sound tissue and carried over into the part to be operated upon. The dilated blood and lymph channels of the inflamed skin allow us to anæsthetize quite a large spot from one puncture.

The injection should be done slowly at first, and when the infiltration is only felt by its tension we may rapidly flood the part to the required extent. Under no circumstances must fluid be primarily injected into an abscess, an exudation, or a pathological focus; the only result is increased tension and pain. We must not lose sight of the cardinal fact that the anæsthesia exists only within the area infiltrated by these solutions. The method rests principally on the production of a complete artificial edema of the tissues. Wherever we wish to operate with exact anæsthesia, the field of operation must be tensely filled with the solution so that it exudes from the cut surface.

It should be remembered that our use of attenuated solutions of the narcotic drugs has nothing akin to the doctrine of the followers of the dogma "*Similia similibus*," etc. These statements may be readily substantiated by self-experi-

mentation. Cocaine injections of solutions of the usual strengths (5 to 10 per cent) are certainly far more dangerous to life than the administration of chloroform. The higher solutions of cocaine surely diminish the exudative process and retard the healing, and in some cases actually destroy the trophic filaments so that gangrene has been known to occur. Nothing of the sort has been found to result from the infiltration of the solutions recommended in this article. Anæsthesia is complete, and occurs immediately, and lasts long enough for almost any external operation. There is no objection at any time to repeating the injection if feeling should return during the operation. Indeed, we might safely operate for hours upon a small area if so inclined. The advantages of the method are also evident from its simplicity, safeness and celerity.

The method has gained credence and is now in common use by many busy practitioners. Operations have been done, from the removal of ovarian tumors, and amputations, down to the opening of boils, without pain, and with satisfaction both to the physician and patient. The writer has personally operated upon the eyelids of half a hundred patients, as well as upon other parts of the body, under this form of anæsthesia, while prosecuting the investigation. His first operation was upon a deep-seated felon. He has assisted at a number of circumcisions, excisions of tumors, and minor operations, making the injections himself. He has had reports from many surgeons in different portions of the United States, of the employment of this method for operations varying in severity from ingrowing toenail to hernia, in which the anæsthesia has been satisfactory; healing has been by first intention, and in only three instances has he had reports in which it has been delayed.

IN MEMORIAM.

RESOLUTIONS ON THE DEATH OF DR. JAMES E. GARRETSON.

WHEREAS, The profession has sustained a great loss in the death of James E. Garretson, M. D., D. D. S., Professor of Oral Surgery in the Philadelphia Dental College. Be it therefore,

Resolved, That the Chicago Dental Society hereby expresses its full appreciation of his distinguished services as a member of the medical and dental professions, and as a practitioner, teacher, and author. Professor Garretson placed the profession under lasting obligations for his invaluable labors in placing oral surgery upon a truly scientific basis. He was, moreover, a man of wide knowledge and attainments in the field of general literature and philosophy, highly esteemed by his colleagues, beloved by his students, and honored by his fellows in the many scientific societies to which he belonged. His loss is well nigh irreparable.

Resolved, That this society express to the college with which he was so long connected, and especially to his family and personal friends, our heartfelt sympathy in their bereavement.

Resolved, That an engrossed copy of these resolutions be sent to his family, and the faculty of the Philadelphia Dental College, and that they be published in the various dental journals, and also spread upon the minutes of this society.

TRUMAN W. BROPHY,	} Committee.
GEO. H. CUSHING,	
GARRETT NEWKIRK,	
A. W. HARLAN,	
J. N. CROUSE.	

In view of the sudden death of Mr. S. R. Bingham, of this city, we, the members of the Chicago Dental Society, desire in our appreciation of his many excellent qualities to place on our records the following memorial :

Though not a member of the profession, yet he was so intimately associated with its members in a business capacity, and was so greatly endeared to many of them by long and loving association, that it seems most fitting that this society should express the sense of its great loss and convey to his family its profound sympathy in this their hour of terrible bereavement.

The deceased has been the representative of the S. S. White Dental Manufacturing Company in this city for nearly forty years, and most members of the profession have met him frequently and almost daily for a greater or less portion of that period, and some have had the high privilege of his friendship during the entire time of his sojourn here.

It would be hard to find a man of purer mind, of a sweeter, lovelier nature, of greater integrity, of broader sympathies, or of more loyal friendship than he. He was, in a word, an example of the highest type of a true Christian in the broadest sense of that term. To those who have known him intimately the sense of personal loss in his going from among us is very keen, while all who have known him at all must feel that an elevating influence has been taken away from our midst. Very appropriately may be quoted of him what he wrote on the fly leaf of a copy of his memorial to Samuel S. White and James W. White, when presenting it to a friend : " Who knew both these and is the better for it." And no more fitting words could be said concerning him than the closing sentence of the memorial above referred to.

" He showed us how to live. Let us follow on in a like faithful service of our fellows, our country and our God, until with him we enter upon a loftier service in the broader fields and under the fairer skies of the eternal home."

GEO. H. CUSHING,	} Committee.
W. A. STEVENS,	
C. N. JOHNSON.	

RESOLUTIONS BY THE ODONTOGRAPHIC SOCIETY ON THE DEATH OF MR. S. R. BINGHAM.

WHEREAS, It has pleased Divine Providence to remove from our midst one who, while not a member of the dental profession, has been so intimately associated with us in his business relations, and whose noble qualities and honorable methods have so won our highest regard and esteem, it is deemed eminently proper for this Society to express its sentiments. It is, therefore,

Resolved, That the Odontographic Society of Chicago recognizes that in the death of Stillman R. Bingham, the dental profession, and the community at large, has lost the friendly and social contact of a truly noble character, of whom it can be most truly said, the world is better for his having lived in it.

Resolved, That the sincere sympathy of this Society is hereby extended to the friends and relatives of the deceased, and that these resolutions be spread upon our minutes, and a copy be sent to the family.

R. B. TULLER,	} Committee
W. H. TAGGART,	
A. G. JOHNSON,	

W. H. DWINELLE., M. D., D. D. S.

RESOLUTIONS ADOPTED BY THE ODONTOLOGICAL SOCIETY OF NEW YORK.

The rapid years have gathered one more of the great men of our profession to his final rest.

Dr. Wm. H. Dwinelle, whose life we commemorate, and whose death we mourn, was one of the great figures in the early days of our young profession.

He was born in Cazenovia, N. Y., where he died at the homestead on Feb. 13, 1896, seventy-six years of age.

Entering our profession at a time when it was struggling for recognition among the learned professions, he brought to it the influence of a remarkable personality, and through his varied attainments, and by his energy and hopeful confidence he helped, as few others did, to place it upon a secure foundation among the learned and liberal professions of the world.

Fitted for the practice of medicine and surgery, he yet saw in the specialty of dentistry a wider field for the exercise of his peculiar genius, and he entered upon his work with boundless enthusiasm. This is shown by his numerous inventions, his brilliant operations, and his contributions to the professional literature of his time. It is also warmly attested by the few surviving companions of those early days.

He assisted in the formation of the first dental college, and was instrumental in establishing the *American Journal of Dental Science*, one of the most dignified and influential journals our profession has produced.

He performed surgical operations in the oral cavity that were the admiration of the general surgeons of the day, and he performed operations upon the teeth that had never been attempted before. Many examples of his work are still in existence to testify to his remarkable ingenuity and to his unusual skill.

A man of warm heart and generous impulses, he freely gave to all who came; his office was always open, and he was ever ready to show his instruments, and his methods to any one who desired to learn.

Having practiced medicine and surgery before he entered the dental profession, he commanded the confidence of physicians and surgeons, and was thereby able to help in an unusual degree, to secure recognition for our specialty, and he stood for many years as a bond between the parent profession and its young offspring.

A man of literary tastes and a devoted lover of art in all its forms, he was able to reflect credit upon our profession at a time when such influences were more needed than at present.

A man of tender sensibilities, he was a genial companion, and his wide sympathies and varied talents made him a great favorite among cultured people.

He was a man of so many gifts that he could have been a poet, an actor, an artist, a sculptor or a literateur; this wide range of talent made him always an agreeable friend.

Before the bar he would have been a great advocate; in the medical profession he would have been a great physician or a great surgeon. He chose to be a great dentist.

For this we honor his memory, and we think it fitting that this society, once presided over by him, should place on record its appreciation of him while living, and its sorrow for his death.

A. R. STARR, }
WM. JARVIE, } Committee.
S. G. PERRY, }
Chairman.

THE DENTAL REVIEW.

VOL. X.

CHICAGO, MAY 15, 1896.

No. 5

ORIGINAL COMMUNICATIONS.

REMOVABLE CROWN AND BRIDGE WORK.*

BY DR. ADAM FLICKINGER, ST. LOUIS, MO.

I believe that crown and bridge work at present commands the greatest attention in modern dentistry.

In the early part of 1892 I constructed a removable crown for a lady. Her case had baffled a number of prominent professional gentlemen; seeing at once, that by adopting their plan and the one generally pursued, I also would make it a failure, I devised a removable crown, which to this day is fulfilling its mission. This was the nucleus to my removable bridge work, the first case being constructed in February, 1892, made entirely of metal with porcelain facings.

In the summer of 1894 I attended a private clinic on porcelain bridge work, given by Dr. Parmly Brown, and at once decided to transform my removable method into sanitary removable porcelain crown and bridge work.

He who has studied symmetry, harmony and color, must be reminded constantly of the lack of that artistic selection and arrangement of artificial teeth, which serves to restore to the face the shape and expression left upon it by the creator, the absence of which in artificial dentures stamps him, who should be an artist, a mere mechanic, a deformer of the human face divine.

That mechanical dentistry should have fallen into the hands of this class of practitioners will hardly be wondered at by those who have watched the history of this branch of dentistry.

*Read before the St. Louis Dental Society.

The introduction of rubber, nitrous oxide and the many local anæsthetics now so extensively in use all over the country, has caused a retrograde movement in prosthetic dentistry, and although they have their merits, their universal adoption has been a detriment to the profession in more than one way, for, so simple are their applications and administrations that a host of incompetent men have been enabled to force themselves upon the public, and many of the better class of dentists have been led to abandon far superior work, simply because the rubber work is easier, and can be done by mere novices in the laboratory.

Not that vulcanite, when properly constructed on scientific principles, does not make a comparatively good denture, but so simple are the modes of attaining tolerably good mechanical results, that a high order of talent is seldom found devoting much time, at present, to this branch of dentistry.

The only advantage vulcanite possesses, when properly constructed, is its cheapness, which brings it within the reach of all classes in the community, and consequently the poor have the same opportunities as their more fortunate fellow-beings. The most serious objection to its use is found in the fact, that the retention of undue heat causes constant change in the alveolar process, the exceptions to which are very rare.

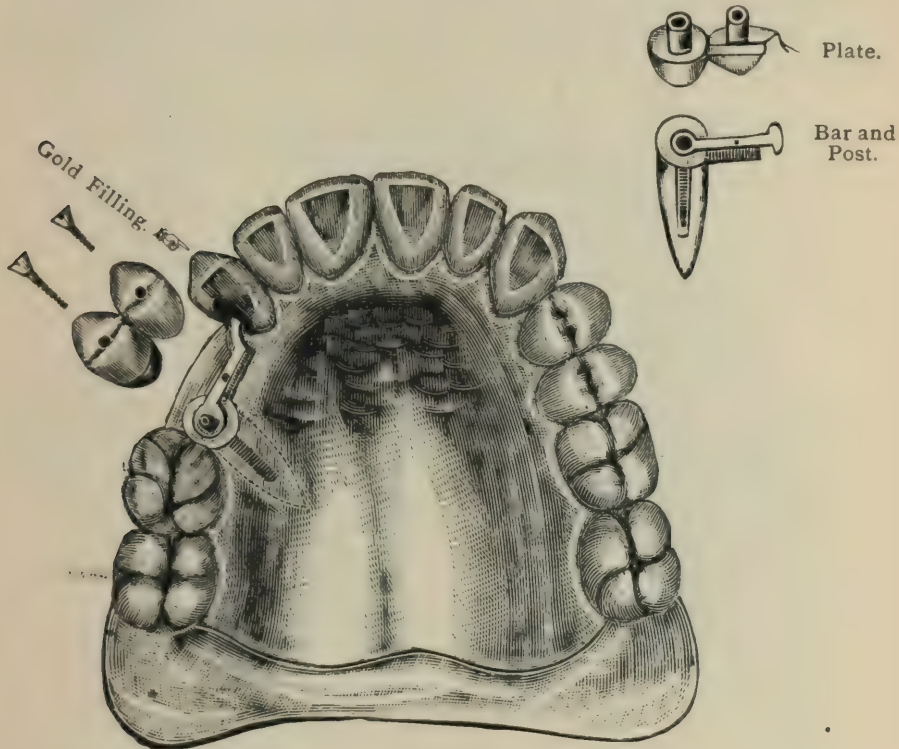
Happily prosthetic dentistry is, at present, making rapid strides to redeem itself, crown and bridge work has stepped in and is forcing itself to the front, so much so, that in the next few years to come it will revolutionize dentistry and bring forth a better class of work; for it not only requires natural mechanical talent, but also demands an inventive genius and an artistic sense of harmony and beauty; so that the mechanical dentist of the future, who has these qualifications will stand eminently higher, as an artist, than many of like title of to-day.

Unfortunately this work has already been attempted by a class of men, who possess neither the required training nor the technical ability, and who by advertising extensively, "Teeth inserted without plates" flood the country with botch work, which failures are causing the first signs of prejudice and condemnation of crown and bridge work.

Artificial dentures, of whatsoever kind, should be constructed on scientific principles. Bridge work is not a "cure for all," but whenever it can be advantageously applied, it should have these

essential qualities, good foundation, pier, or anchorage, whichever term you choose to call it; having this, it should be made of some material, which is durable, nonabsorbent, nonirritating, noncorroding; be so arranged as to allow no place for lodgment of food or secretions, and be easily removed, repaired and replaced, and when feasible, display no metal.

The height of our art is to conceal artifice; but setting metallic shells, or half shells, or so-called open-faced crowns, if you please, formed in imitation of teeth, in the front of the mouth, where they



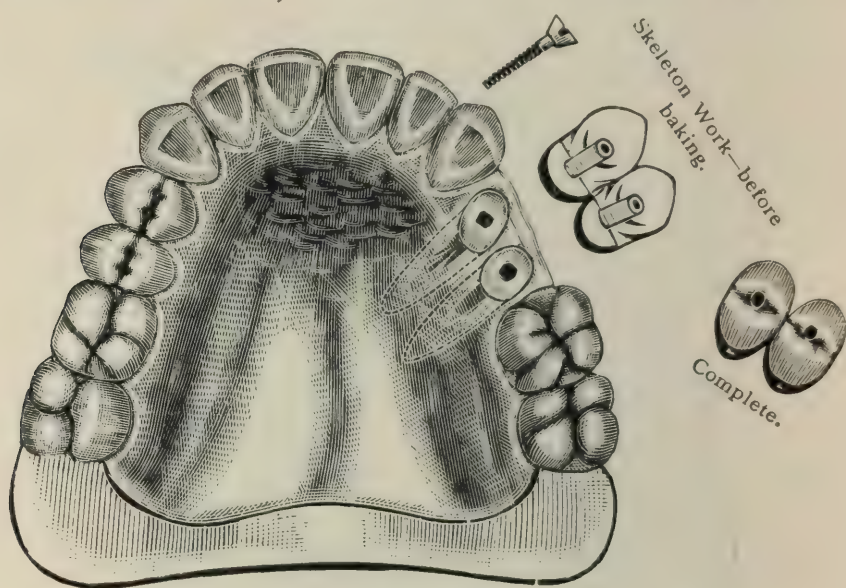
CASE 2.*

invite attention by their foreign and artificial character, is not art in any proper sense of the term; instead of hiding the evidence of destruction in the natural teeth, we call attention to that fact, in the most emphatic manner.

What right (professional or moral) has any one to place in sight anything so pronouncedly artificial, as to attract, when he should divert attention? This advertising the loss of the natural teeth instead of hiding it, is wrong; no man, practicing our noble profession, whether prompted by the vanity of his patient, or by his own stupidity, has a right to place a gold shell in any mouth where

* Case 1 omitted.

it will be conspicuous. In the upper jaw of a lady's mouth a gold crown anterior to the second bicuspid should be condemned by all who possess the least artistic taste; in a gentleman's mouth, screened by a heavy mustache, I should not consider it offensive. It is a deplorable fact that the manufacture of gold shells is on the increase; this is decided retrogression in dental taste, and the time is not far distant when we, as well as the more enlightened public, shall all realize this fact. When we practice dentistry, let it be from a standpoint a little above that taken by the heathen, who fancy themselves beautiful when they display gold and silver in noses and ears. We should elevate our profession by teaching in



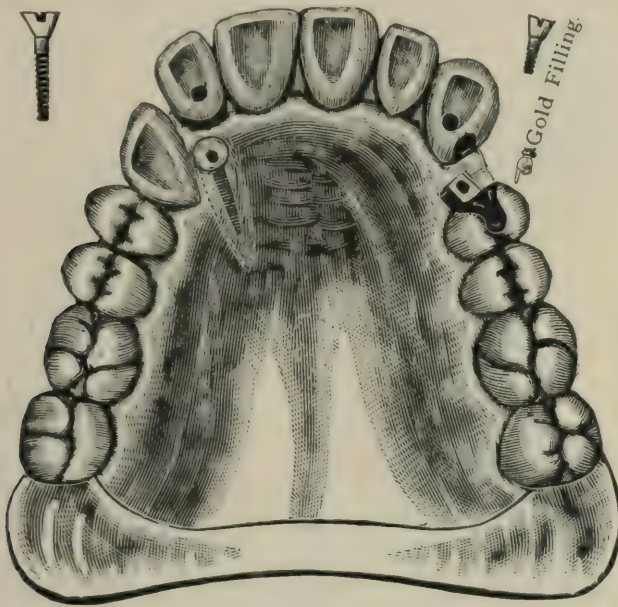
CASE 4.*

the colleges to avoid display, and by educating our patients to frown upon this whole pretense of gilded substitutes for teeth. There is no justification whatever for these shining disfigurements glistening from the mouths of our fair patients. When they ask for or require teeth, construct some for them, but do not plant a golden memorial to commemorate the loss of the predecessors, or to advertise—not your ability, but your own bad judgment and ignorance, bad taste and low order of artistic conception.

I shall now endeavor to demonstrate a principle, which I have followed for the past three years with not a single failure to record—a record of which I am justly proud, and will illustrate the fact that crowns as well as bridge work can, in the majority of cases,

* Case 3 omitted.

be constructed without the objectionable features previously alluded to. A full shell gold crown should never be placed in the anterior part of the mouth—it is hideous to say the least! On roots where practicable, I prefer to construct a removable crown for many reasons. If the teeth surrounding the root or tooth to be crowned, are of a class or in such a condition that indicate an early destruction, I should always use the removable plan—if so constructed, it saves labor and expense in case of an extension. As, for instance, you are called upon to place a crown on a badly decayed or broken central incisor; you find that its mate or the balance of anterior teeth are filled, but fillings defective and teeth



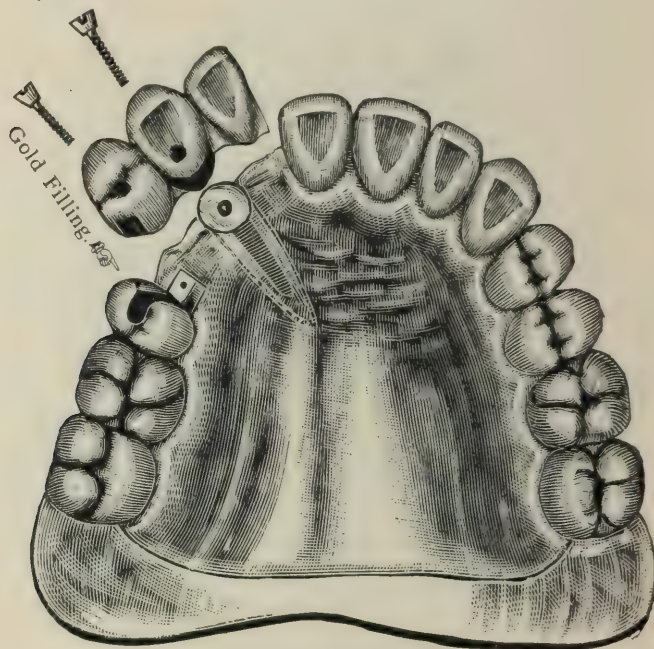
CASE 5.

of a class which justifies their condemnation—when this time arrives, unscrew the crown and add all the work required (without the tedious and laborious exertion necessary in removing a stationary crown) especially so, if from some cause it may require the extraction of one or more roots next to the removable crown.

In bridge work I follow the principle of a girder bridge whenever practicable, constructing the girder or span first, to which the superstructure is attached. By so doing I have full control of the minor details around the piers and anchorages. In Case I., you will observe where roots are missing, my bridge consists of a longitudinal bar, which rests snugly on the gum and is anchored to the natural teeth. To this principle I have, in the past year,

added one of Dr. Parmly Brown, and have constructed the superstructure of a heavy platina iridium saddle.

Having fully tested my principle since 1892, I can pronounce it a success, if carried out with due regard to the essential requirements of bridge work, namely, a good foundation, the class of teeth (whether of soft or hard structure), or roots, to be used as piers or abutments, healthy or diseased condition of the mouth, age of the patient, etc. It has stood the test as well as any work which has come under my observation for the past thirty years, and it possesses more of the essential qualities than most dental bridge



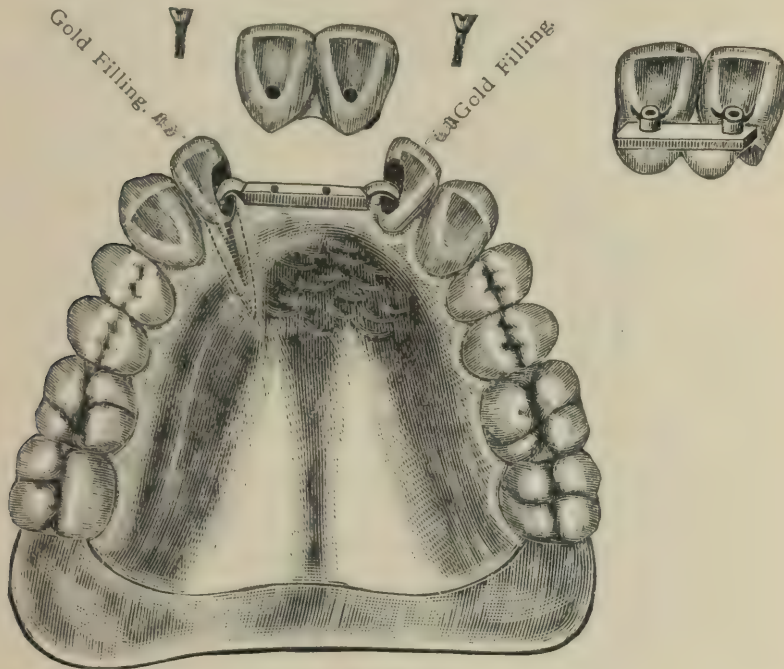
CASE 6.

work with which I am acquainted. It has all the strength that can be placed in a piece of work combining elegance and beauty; it is easily removed, readily repaired and replaced, and its cleanliness makes it a blessing to the wearer.

Dr. Haskell writes in the *Ohio Journal*: "Fifty years in the laboratory. Since the introduction of rubber and celluloid there has been a set back to prosthetic dentistry until the introduction of crown and bridge work. Dr. Land is entitled to credit for the introduction of the jacket, crown, etc., but by far greater is Dr. Parmly Brown's method of porcelain crowns and bridge work, which seems to be the ne plus ultra of prosthetic dentistry, its two

most important features being the nonmutilation of teeth and showing no metal in the mouth."

Being familiar with Dr. B.'s work, I agree with Dr. Haskell, with this objection, however: The completed bridge, constructed on Dr. Brown's method, is more difficult to fill into position than it should be, especially if gold be used as a filling material to retain the bridge in the natural teeth, the bridge acting as a barrier to your work. The construction of dental bridge work in general is analogous to the attempt of the engineer who starts the superstructure of an iron bridge at the foundry and after its completion



CASE 7.

removes the same to the place he intends to span, sinking it at random into the ground, regardless of one of the most essential parts, "the piers," is it not a fact that crown work is generally made with band and pin, adding a little cement, pushed up into the root without proper control of that important part, the pin, on which depends all the stability, and which should be under full control of the operator, to make it a success?

My principle, as you will observe, allows you to construct that most essential part, the foundation, unobstructed; you have full play and free access to your cavities, and, if roots are utilized as piers, you can cement in your screw threaded pin unmolested, and

then fill around the same with any other metal filling. It is composed of six parts as illustrated, made of platina iridium ; for bars I use gauge 10 wire, for screws gauge 12, for slide and saddle gauge 24 plate.

In the work I intend to explain to you to-night, you will find that my construction is an improvement on Dr. Brown's, at the same time possessing the qualities so highly praised by Dr. Haskell ; its advantages are that the bar is more readily, and can be more thoroughly filled into the intervening space than the completed bridge, it can be removed and replaced and will clinch the gum more snugly than any other method, one twist of the screw will force it up into the gum, and in case of slight receding of the gum or elongating of roots after a number of years' wear,



CASE 8.

it can be brought home again without any trouble, by simply grinding off the elongated roots and screw posts slightly.

For *Case 1* construct an elongated bar as shown in Fig. 4 with two projecting ends to enter cavities in lateral and bicuspid ; then make a box or slide, Fig. 5 on top of which solder nut box 2. This accomplished, fill bar into place, use gold in anterior teeth ; when finished screw on slide and take impression, remove and make plaster cast, solder your saddle on labial and lingual side of slide ; this done, return to model and grind teeth in place, choose cross pin teeth, arrange so that nut box fits between pins, to which the latter may be soldered, after which bake lingual contour to same, completing the whole work, ready to be placed into position in less time than it takes to describe it.

Case 2, shows first and second bicuspid. First missing root of second in good condition, canine decayed slightly. Construct band for root as usual, making a complete cap, allowing your screw threaded pin, Fig. 1, to project slightly, so that cap will encircle the pin, then solder onto cap nut box 2, construct bar 5

with one projecting end, solder same to pin, then fill it into place, screw on cap and slide box 4, take impression and proceed as in Case 1.

Case 3. An extensive bridge, bars and piers in use.

Case 4. Two bicuspid, first and second anchored to the root.

Case 5. An extensive bridge of five teeth, anchored on one side to lateral root, retained on the other side by bar filled into second bicuspid with gold filling.

Case 6, illustrates a very defective second bicuspid. First bicuspid root missing, canine root good and lateral root missing. On second bicuspid, place shell crown with bar attached, pier in canine root. The wearer of this bridge is present this evening and has consented to show the work at the close of this paper.

Case 7. Two centrals, constructed on the same plan as Case 1.

Case 8, illustrates a single crown of which I may say, that it was the initiative step to my method of removable crown and bridge work. I am happy to say, that I am prepared to place an identical case in a patient's mouth this evening, in your presence.

The advantages I claim for work constructed on my principle are : durability and cleanliness, because it is constructed of heavy platina iridium, the toughest and best metal that can be placed in contact with soft tissues ; it is both strong and cleanly, because the teeth are first soldered to the foundation, after which the contour is baked over the metal, glazing the whole surface, and allowing no absorption of fluids, etc It is artistic, showing no unsightly metal and making no jewelry shop show window of your patient's mouth. It is easily removed, and repaired and replaced in case of an accident ; or, if requiring an extension, it can be done without mutilating the piers, abutments and fillings which retain the work.

In conclusion, allow me to say that the first ten cases of bridge work constructed on my principle, were placed in the mouths of gentlemen, who as you know, are less careful, have a more powerful muscular development, chew tobacco, smoke pipes, abuse their masticating apparatus more than the gentle sex, and as a rule are less inclined to keep their mouths cleanly ; among all these I have not had a single defect of breakage, or loosening of posts, caps or anchorages to record. This should give the assurance that the principle is correct and can be classed among the successful ones admitting that bridge work, no matter how or by whom constructed, is not a cure for all toothless people.

DOCTORATE ADDRESS.*

BY C. N. JOHNSON, L. D. S., D. D. S., CHICAGO, ILL.

GENTLEMEN OF THE CLASS OF '96 :

It is reported of an old negro slave who had long been sighing for his liberty, and dreaming of the days when he might of his own free will go withersoever he wished, and do whatsoever seemed best to him, that when freedom was finally granted he suddenly lost his enthusiasm and, looking about him in a helpless sort of way, appealed to his former master in the following strain : " Fo' de Lawd Massa, I dunno whut ter do, ner whar ter go. I don' wanter go norf 'case dey say it's too col' up dar; I ain' ergoin' souf 'case dey's too many niggers dar already; Ise erfeard ter go eas' 'case I don' know nuttin' 'tall about dat eas'; and I ain' ergoin west fear I'm li'ble ter step ober de jumpin' off place. So Massa I wish you'd jest lemme stay here along 'ith you same as befoah, so't ev'ry mo'nin' and ev'ry night I'll hev yer close ter han' ter tell me whut ter do."

Possibly in a vague way the sentiments of the old negro slave may be echoed in the minds of some of you young men here to-day. For three long years you have been toiling toward the goal of freedom, which according to your ideas, was typified by the possession of a diploma, and now that you have attained the end I doubt not that there may be those among you who experience the same sense of bewildering helplessness that overwhelmed the poor old slave. You have in these three years quite naturally fallen into the habit of leaning heavily upon others for support. In the nature of things you have constantly been obliged to appeal to your teachers to tell you "what to do," and the new experience of being suddenly thrown on your own resources may give you pause and make you wonder if after all the possession of a diploma is the open sesame to happiness that you had fondly dreamed it to be.

And yet the time has come for you, as certainly as it came for the old slave, when you must assume new responsibilities and adapt yourselves to new conditions. Lying along the broad avenues of this busy world there are fields requiring your especial

*Delivered to the graduating class of the Chicago College of Dental Surgery, Schiller Theatre, April 7, 1896.

cultivation, and you can never hope to carry on your work to its ripest fruition if you continue to rely on others to direct your efforts. It is to be regretted that while our present system of college teaching has in the main advanced far beyond the dreams of the most sanguine prophet of a decade ago, it still leaves something to be desired in the development of a sturdy self-reliance which shall place the young man firmly on his feet in the early days of his professional career. Students, on account of the help that is constantly given them on every hand while in college, are too prone to fall into the habit of depending on the judgment of others instead of cultivating their own. But this cultivation must come before they can hope for the highest degree of success, and you young men here to-day may carry with you the assurance that, while you are possibly hedged about by some of the limitations which naturally accompany youth and inexperience, you are at least as well equipped to go out and win success as any body of young men who were ever graduated from an institution of this kind. I am even sanguine enough to believe, in view of the character of your work during the session just closed, that no class has ever before been turned out of college which in general proficiency, along those lines of work where proficiency is most imperative, can compare with the class which we as professors have been wont to term affectionately "the boys of '96."

We shall watch most anxiously your future development, for believe me our interest in you is not severed by the mere act of signing your diplomas. We look to you to help us to sustain the reputation of your Alma Mater, and we shall be as proud of you as you can possibly be of yourselves if you succeed in placing your names high in the history of your profession.

But I must not fail to mention one danger which, in my past experience with recent graduates, I fear may possibly beset some of you. I have just been urging you to the cultivation of self-reliance, and yet there is one fault more fatal to your future prospects than lack of confidence, and that is overconfidence. You had better know that you do not know, than to believe you know when you do not know. A man is comparatively safe when he realizes his limitations if he has sufficient manhood to make the effort to overcome them, but the man who fails to realize his limitations will never advance because he sees no necessity for making the effort. A young man who has successfully coped with the different prob-

lems which confronted him in college is likely to believe that he has reached the summit, and is in some danger of contenting himself with present attainments, but no man in the contemporaneous development of dentistry may feel secure in his position when the knowledge of to-day is so often supplemented and overshadowed by the knowledge of to-morrow. Neither must the young man think that because the brief span of his college course has passed with few failures, that failures will always continue to conveniently pass him by. Failures will come sooner or later, many or few, and the progressive man is he who learns more by the failures of the passing years than by the few chance successes of his early efforts. After all, it is the ripened experience of maturer years that teaches the most lasting lessons, and it is the fate of most men to live the greater part of a lifetime before they discover their own limitations.

The overconfidence of youth in contrast to the humility of ripened age is so well illustrated by a story I heard a few years ago that I am impelled to beg your indulgence while I attempt to repeat it.

A young man fresh from one of the colonial mansions of that dear old State, Virginia, went to college and was graduated with the highest honors. After commencement day he came back to his old home, and with the laurels of his college victories full upon him he was welcomed to the family hearthstone with that wealth of affection which flows so freely from southern hearts. His friends were proud of him and justly so. After the festivities of the day were over and just before retiring he stepped out on the broad veranda to catch a breath of the cool evening breeze which was rustling the vines and creepers twining so tenderly among the carved work on the veranda. Pushing back his hair to bare his brow to the refreshing influences of the night, he looked out at the twinkling canopy above, and there he saw the beautiful evening star like a glittering gem among the lesser lights. In the flush of his eager young manhood, and with the memory of all the knowledge he had acquired at college rushing over him, he looked up to the star and said:

"Twinkle, twinkle, little star,
How well I know just what you are!"

Years passed, the young man went to one of the western States, became a professor in a college, and finally was honored by

being elected to the presidency of a prominent university. His fame spread far and near as a man of the ripest scholarship. In the end he was accorded all of the honors that are due to the highest mental attainments.

At the zenith of his fame when he was no longer young, when the years behind seemed greater than the years ahead, the gray haired man bethought himself that he would like to go back to his old home once more. He found the homestead still standing, and he sat about the same hearthstone but with another generation than the ones who had welcomed him home in his youth. All things had mellowed and changed—all things save one. When he stepped out on the old trembling veranda at eventide he saw sitting serenely in the heavens the same evening star that had greeted him when fresh from college so many years ago. And to-night with all the wealth of learning which the added years had given him, with all the ripened experience which had come to him from a life filled with thought and study, he looked at the star and said:

"Twinkle, twinkle, little star,
How I wonder what you are!"

And yet from this I would not have you think that I disparage the splendid enthusiasm of youth. Without this no man ever attained to the greatest heights, and while it may not be yours to successfully read the stars, yet I have no argument here to-day against your casting your vision as high as the highest star in the firmament of the future. Who knows after all but what it shall be given one of you young men who graduate to-day to solve some of the perplexing problems which the best minds in the profession have so long labored on in vain? And should this be your happy experience, I can assure you that none will rejoice more or feel greater pride in your attainment than we, who to-day have signified our willingness to stand as your professional sponsors before the world. We trust that you will yet make us supremely proud of you.

Probably the majority of you in looking forward to your future professional life have outlined in your minds something of what your professional policy shall be. You have conceived this idea or that idea, as likely to contribute to your success, and have laid your plans accordingly. This is well, for a young man should study carefully the outlook and be prepared to avail himself of every op-

portunity that presents. And yet I fear that the vision of most young men on leaving college is too much warped in the direction of financial gain to give them the broadest ideas of what really constitutes true success. I doubt not that most recent graduates are revolving the question in their minds as to how much money they shall make the first year, or the second year, or the third year. This is well enough in a way, for the question of finance is a very practical and a very proper one, but it is not all there is in the summing up of a successful life. And I may say to you to-day, that it is not so much the amount of money you make in a year, as it is the amount you save. It is not so much the amount of money you save, as it is the degree of happiness you gain for yourself year after year. It is not so much the degree of happiness you gain for yourself as it is the happiness you give to others and the amount of good you accomplish in the world. After all, the keenest enjoyment a human being ever experiences lies in the satisfaction of having contributed to the enjoyment of others.

Looking at life from this basis you young men have much to be thankful for. To you it is given more than to most men to add to the sum of human happiness, for he who relieves human suffering is one of the greatest benefactors of his race. Imagine a little child, tender, delicate and sensitive, a little child wrought up by days and nights of weary suffering—imagine this child coming to one of you young men with tears streaming down the little cheeks and the big eyes full of fear; and you, by virtue of the tender ministrations which should constitute the best art of the dentist, soothing the suffering, quieting the fear and sending the little patient away with smiles and cheering prattle, and you can imagine no accomplishment in the ordinary walks of life more delightful than this. It is thus ordained unto you by the practice of your profession to do something for humanity which the millionaire with all his money cannot accomplish. He who is called upon to minister to the sufferings of delicate women and children has no mean office to perform, and probably most of your duties will lie with these two classes.

In this connection let me say something to you about your bearing toward the lady patients who come into your office. In these latter days when the blessed privileges of the "new woman" are being heralded as indicative of the coming emancipation of the sex, when woman is pushing her way into the various walks of life

which heretofore have not been considered available to her, I fear there is growing up on the part of the men a tendency to fall away from that courtly bearing and gracious gallantry toward women which to me marks the highest and most appropriate phase of manly demeanor in the relationship of the two sexes. I am a believer in that dignified condescension which makes a man intuitively doff his hat in the presence of a woman, and I am not even beyond admiring a man who refuses to sit while a woman stands. I am willing to accord to a woman every privilege that belongs to a man—except one—the privilege of standing in a public conveyance while men are sitting. I am willing to grant to her equal rights with man—and one more—the right to be protected. You young men as you go out into the world and meet your lady patients day after day may do something toward the revival of that delightful spirit of chivalry which ennobles and elevates the man who grants it no less than it inspires and pleases the woman who receives it. Treat your lady patients with the utmost respect and consideration. Do not forget for one moment the reverence that is due every woman, simply because she is a woman. Train your hand and brain to do her work with the least possible suffering, for woman is called upon to suffer enough, let her pathway in life be made as easy as it may. Your success in practice will depend largely on your ability to understand and please your lady patrons, and while I may warn you now that you need never hope fully to understand a woman, yet there are many ways in which you may please her, and the surest way is to invariably show her kindness and respect. Do not be above receiving counsel from women as to the conduct of your affairs. I am free to acknowledge that some of the best advice I have ever received has been given me by women, and I know of no surer safeguard over a young man's conduct and practice in starting out in life than the interest and admonition of a pure and loyal woman. May it be the good fortune of each and every one of you to be made the recipient of some good woman's confidence, and may you follow this as your guiding star to success.

But now the time has come for us to say our farewells. For three years we have labored together as faculty and class and that you, at least, have done your duty in these years is indicated by the fact of your presence here to-day. We congratulate you most heartily on the happy consummation of your labors, and we

can assure you that while we send you forth to the world as full fledged dentists, we shall still continue to remember you in the light of our professional offspring, and to cherish the same fond hopes for your future which animate and render beautiful the aspirations of a mother for her children. You have grown very near to our sympathies in these years of your studentship, and we trust that you will not allow the closing of your college course to mark the decline of the friendly relations which cement us together. We shall be interested in your welfare, and we wish you every good and perfect gift that can come to man.

And now let me admonish you as the last public utterance that passes from us as a faculty to you as a class that you hold sacred the trust that we have reposed in you to-day. This trust implies something more than the performance of your professional duties; it means the living of an upright life. I speak to you not only in behalf of your Alma Mater, but in behalf of those who are near to you by the ties of nature—the fathers and mothers, the sisters and brothers, the sweethearts and friends—they who to-day are watching you with a wealth of love and devotion, springing from hearts made happy because of your happiness. I speak for these and I appeal to you to preserve through life the precious pearl of honor. Let your every step be made with the highest ideals in mind, and ever strive to be true to the best that in you lies.

Be true, I have heard it whispered
That an angel sang a song,
Sang it in earth and heaven,
Chanted it low and long.

And the song that the angel chanted
Was meant for the sons of men,
To teach them a truer maxim
Than all the commandments ten.

And the theme of the angel's singing,
Though written in words so few,
Was wide as the world of morals,
Was wider than worlds—be true.

Be true to the best within you,
Be true with heart and hand,
Be true against temptation,
Be true on sea or land.

Be true with man or woman,
Be true with friend or foe,
Be true in sunshine or shadow,
Be true in weal or woe.

Of all the precious precepts,
The best I leave to you—
The theme of the angel's singing—
Be true, my boys, be true.

THE ELECTRICAL ASPECT OF CATAPHORESIS.*

BY L. E. CUSTER, B. S., D. D. S., DAYTON, OHIO.

During the past year the literature and discussions upon cataphoresis have developed so many remarkable statements from an electrical point of view that it seems in place to give a few personal observations in this connection.

Since cataphoresis is a modification of the electrolytic property of electricity, the current must flow in one direction. It may be continuous, pulsating or interrupted, but so long as it flows in one direction when it is in action, the result will be the same, and a suitable agent will be carried with it in cataphoresis. It has long been observed, however, that the more uniform the pressure is maintained on a continuous current the less it is felt in its various applications in electro-therapeutics and in proportion as the pressure varies, while it may still be continuous, will it be painful to the patient. So it may be stated that under steady pressure a small continuous current is not painful but becomes so when it pulsates. It becomes more so when it is interrupted and still more so when reversed in direction. It is for this reason that the interrupted current is used in shocking machines and that the alternating current is so deadly. Dr. Morton and others prefer the galvanic current partly for the steady voltage which is characteristic of this current and the small amount of pain accompanying its applications. On the other hand there are those who claim that the Edison current furnishes a practically steady voltage. Theoretically the galvanic current gives the more uniform voltage, but those who use it seem to forget that they annul this virtue of battery power every time they touch the rheostat for increasing the current as is customary in its application.

The Edison current is ordinarily supplied at 110 volts pres-

* Read before the Miss. Valley Dental Society.

sure. In my city I have noticed by my own volt meter that during the whole twenty-four hours it does not vary five volts and

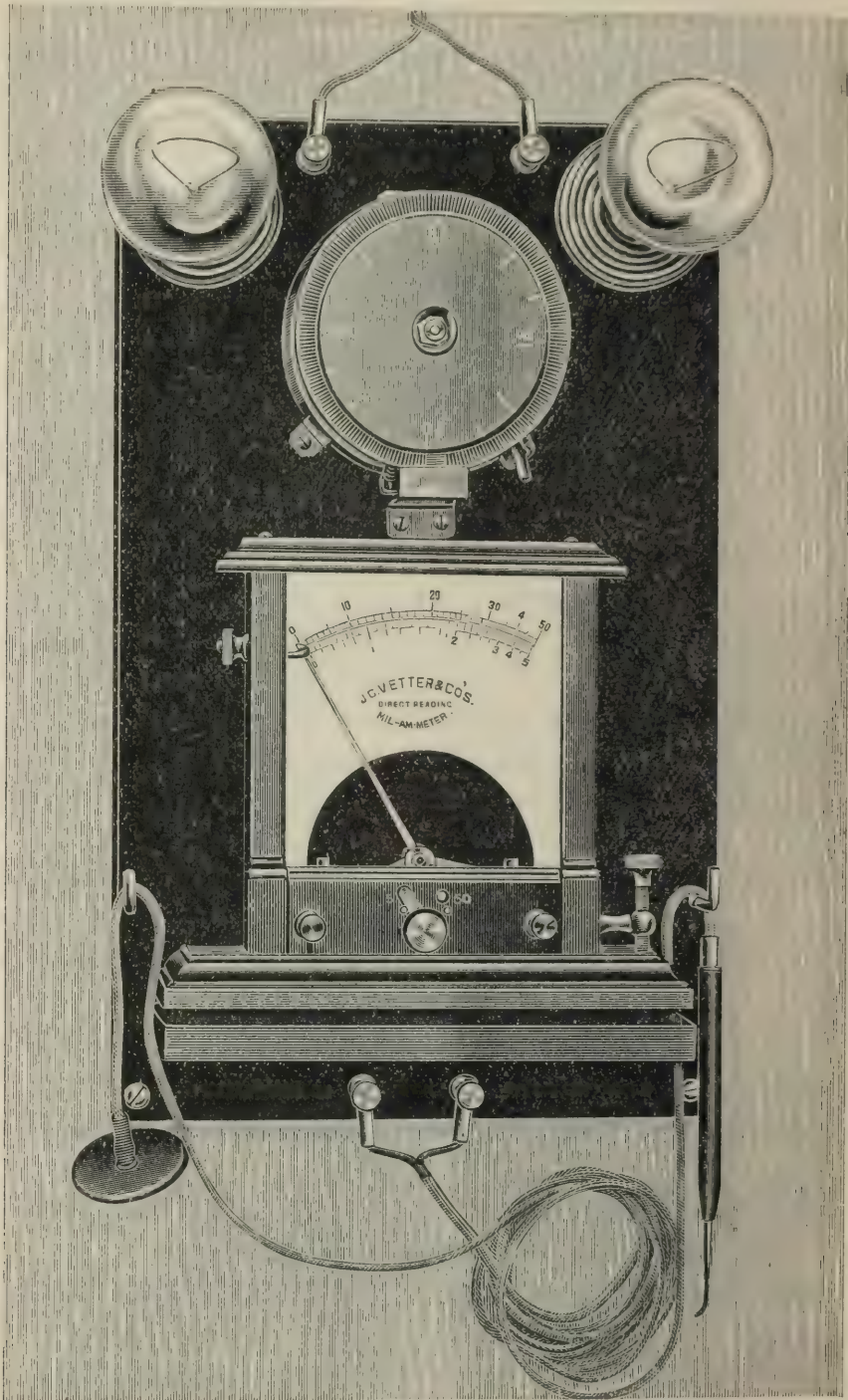


FIG. 1.

that during the daytime especially it does not vary two volts. The widest variations occur between 4:00 and 10:00 P. M. Now when this current is used for cataphoresis by the appliance which I have

devised for that purpose, by which I get the cataphoric current by a shunt circuit, the variation in voltage at the poles is in proportion, as the cataphoric voltage is to 110. For instance, if the Edison voltage is 110 and the cataphoric voltage averages ten during the application, it would be necessary that the Edison current vary eleven volts to produce one volt variation in the shunt or in other words, a variation of say five volts, an unusually large variation, in the main, would produce a variation of but half a volt at the cataphoric poles. Yet why object to this when the operator increases the voltage from one to five volts at each manipulation of the rheostat?

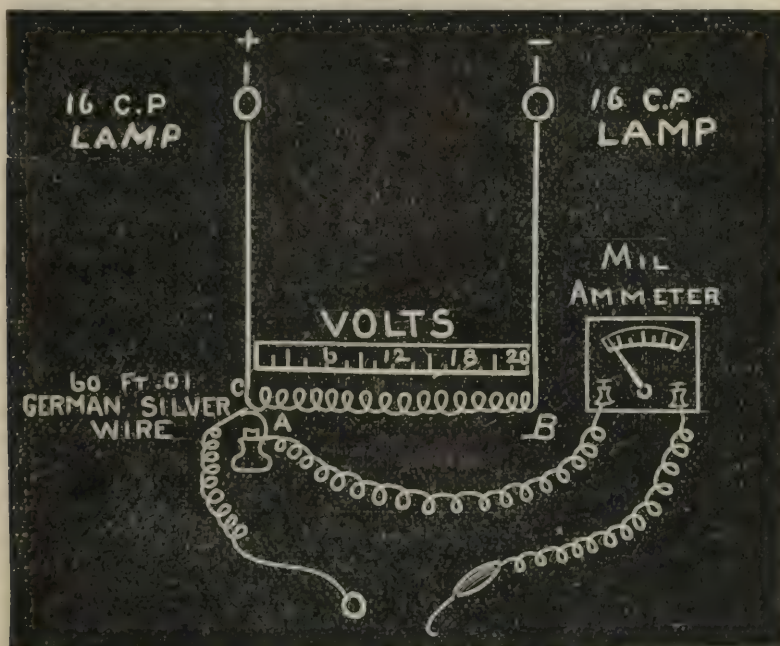


FIG. 2.

Altogether the objection to the Edison circuit that its unequal voltage is perceptibly felt, does not appear as strong as claimed. It may be that where the poles of some appliances are directly in

TO THE EDITOR: You will find under separate cover photo and diagrammatic illustration of appliance for cataphoresis. The diagram corresponds with the paper read, but since that time I have completed the clock attachment for accurately turning on the current. This reduces the pain of the application. The wire is wound on the periphery of a four-inch fiber wheel which dips in a cup of mercury to make the contact which is represented by brush A. Instead of this brush moving, the same thing is accomplished by moving the resistance and keeping the brush stationary, which is done by a lock mechanism.

The operator has then only to see that the cavity is kept flooded with the solution during administration.

Very truly,

L. E. CUSTER.

the circuit and in series with high resistance that the variation in the voltage is perceptibly felt, but in the appliance which I here present the variation averages very much less than one volt during an application and this is not perceptible. In many cases it is necessary to increase the pressure two to five volts before the patient feels the increase.

Many of the reports of cases have varied so much from the common electrical formula and from my own observations that either the measuring instruments were not correct or were not properly used. In one instance a writer speaks of increasing the current without increasing the voltage at the same time, while the resistance remained the same, notwithstanding the fact that electricians have for seventy years been substantiating the law laid down by Dr. Ohm, that the current strength in any circuit is equal to the electro-motive force divided by the resistance. It is not possible to increase the current through a constant resistance without increasing the pressure, or to use a common illustration, you cannot increase the flow of water through a pipe of a given size without increasing the pressure.

The wide difference in the amount of current also led to some experiments as to their cause. The enamel consists of about 97 per cent lime salts, which is a nonconductor of electricity, and the remaining 3 per cent is such a small amount that it offers so much resistance as to be practically a nonconductor. This fact, that a sound tooth is covered by a nonconductor of electricity, may have a wider significance than we at first thought would allow and it may have a physiological significance as well. At any rate the fact that enamel is a nonconductor of electricity is an important consideration in cataphoresis.

On the other hand, about one-third of the dentine is made up of animal matter which contains water and is a comparatively good conductor. The matrix of the dentine is almost solid lime structure, and like enamel is a nonconductor. But within the tubule is contained the dentinal fibril which is made up almost entirely of water. It is this that we wish to obtund, and fortunately its large percentage of water makes it a good conductor. When the current is applied it follows the course of these canals to the pulp. Here I will call attention to the importance of enlarging the cavity with the chisel at first, about as it is desired when finished, because the fibrils anastomose so little that the area of anæsthesia is confined almost entirely to those tubuli whose mouths open into

the cavity. In a long application in a deep cavity however the pulp becomes affected and the fibrils supplied to other portions of the crown lose their sensation as deeply down as the pulp itself has been affected.

So then the enamel being a nonconductor of electricity and the path of the current following the tubuli through the dentine it is easy to understand why in some instances an operator could use one milliampere while in another but one-tenth as much at the same voltage. A small exposure of dentine is like a small wire, it offers more resistance than a large cavity or a large wire. In the practical operation of cataphoresis we must consider the path from the positive pole in the cavity to the negative pole at the sponge to be like a funnel with the small end equal to the area of exposed dentine and the large end the area of the sponge upon the face. No more water can flow through the funnel than can pass through the smaller end, and so no more current can flow than can pass through the exposed tubuli, and the current increases in proportion to the size of the cavity at the same voltage. It is for this reason that an ammeter is not of much practical value for dentine anæsthesia. It is often a satisfaction, however, to know how much current is being used in the operation, but if it is to be used for recording and the establishing of tables the size of the cavity must also be tabulated.

Dentine which has been denuded of enamel for a long time will probably offer greater resistance than freshly exposed dentine.

The position of the negative electrode has much to do with the application of the current. The shorter the distance this is placed from the tooth under operation the less voltage will be required to force the current through, and the less will be the variations due to the alleged unequal Edison current. After experiment I find that it requires about three times the voltage when the sponge is held in the hand than when held upon the cheek, so would recommend that the negative pole be placed upon the cheek and held in place by the same appliance which ordinarily holds the rubber dam back. This has been my method, and it is seldom that the voltage exceeds fifteen, while in some accounts I see it is very much more than that.

As to the detail of manipulation it is essential that the current be not broken during the application. This is very likely to occur if the anode is held by the operator. Even if the instrument does not come entirely out of the cavity it is very difficult to hold

it perfectly quiet for the ten or fifteen minutes of the application. The least movement is perceptible to the patient, and especially if the cotton is not well saturated. To avoid any such dangers I have devised an anode to be slipped on the ordinary rubber dam clamp. This appliance is so constructed that the anode is electrically insulated from the clamp and at the same time is firmly held in position. This allows the operator free to manage the administration of the current. In this connection I might state that appreciating the fact that a gradually increased current is much less painful than one by steps. I hope soon to complete an appliance actuated by clockwork which will meet the requirements of dental cataphoresis.

It may be worth while to call attention to the placing of the anode in the cavity. It is to be inferred from reports that the operator generally places a saturated pellet of cotton in the cavity and then holds the anode upon that. The reverse should be the order. Secure the instrument in the cavity and place a heavily saturated pellet of cotton about it and the instrument will be flooded about by capillary attraction, and any small movement of the instrument will not be perceptible, whereas if it is placed upon the cotton the loss by electrolysis is noticeable and there is greater danger of breaking the current.

The appliance which I have devised for this purpose is made in this manner: one 8 c. p. or preferably two 16 c. p. lamps are used for the main resistance. Two 16 c. p. lamps are preferred only for safety, as a ground would meet with resistance on either wire. In series and between the two lamps is placed a resistance coil of about sixty feet of .01 German silver wire wound in a No. 34 thread cut in a rod of fiber an inch in diameter and seven inches in length. To the wire to the left is attached the wire leading to the cathode. An ammeter may be placed anywhere in this wire. The wire from the anode is attached to a movable brush which slides along in contact with the resistance coil. If the anode is placed in the cavity and the cathode upon the cheek a circuit from the brush A to C will be closed through the patient as well as the one from A to C through the main line. The circuit through the patient is called a shunt circuit. When the brush A is at the left no current flows through the patient because the patient offers so much resistance and there is no resistance between A and C on the main wire, but on moving A from C, the resistance between the two points A and C increases so much that the current divides and

a little is sent through the patient. The amount of current flowing through one branch of a divided circuit is inversely proportionate to the resistance of the other branch, so that if the resistance increases in one branch more current will be forced through the other. So by this arrangement if A moves toward B and 16 c. p. lamps are used, as illustrated, there will be a range of twenty-four volts from A to B through the patient. If instead of 16 c. p. lamps, 20 c. p. lamps are used, there will be a range of about thirty volts, and so on.

Such an appliance can be made at a very small cost and since the operator is guided by signs from the patient how much current to use, the volt meter and ammeter are not strictly necessary. The marking of the volt scale can be done by connecting a standard voltmeter at C and at the brush B and marking off the voltage shown at different positions of B. Such a scale is practically as accurate as if a volt meter were used in connection with the instrument.

ABNORMAL DEVELOPMENT AS A RESULT OF TRAUMATIC INJURY.

By W. H. Fox, D. D. S., CHICAGO, ILL.

Case of superior left lateral incisor, extracted on account of disfigurement.

Patient, a young man twenty-one years of age ; previous history unknown.

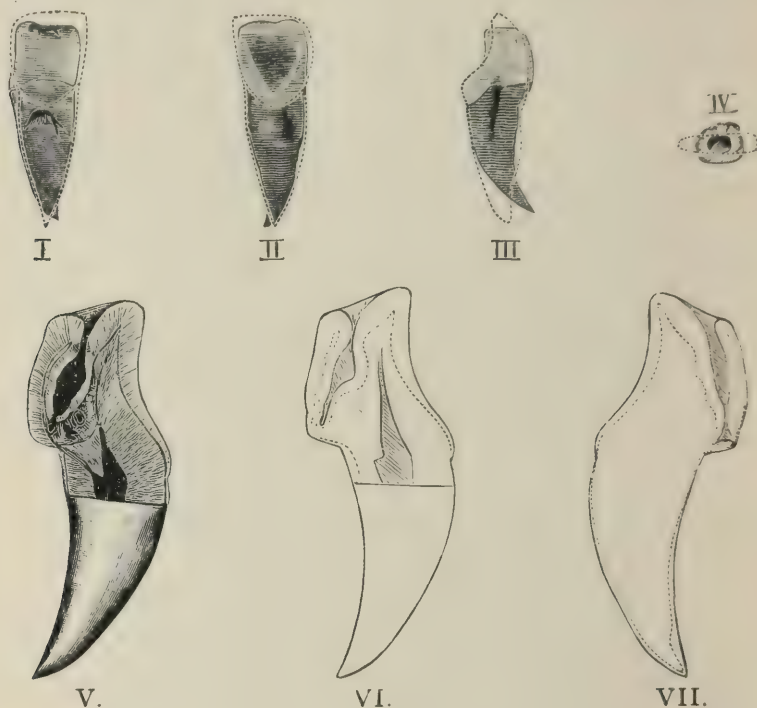
Length of tooth, 22 millimeters ; mesio-distal diameter of crown, 8 millimeters ; labio-lingual diameter of crown, 7.5 millimeters.

The position in the jaw occupied by this abnormal tooth, combined the space usually held by both central and lateral incisors. In this case the lateral was absent, the root of the abnormal tooth occupied the place of the lateral root and its crown occupied the place of the central crown, the axial direction being at an angle of about 45° to the median line.

The labial aspect as shown in Fig. 1, presents a disproportionate surface of root and crown at the expense of the crown surface. The crown loses in this aspect both axially and mesio-distally. The root gains only in length and is removed in its entirety at the neck, distally. The root also shows an indentation, at one-fourth its length from the crown, extending some distance into its substance.

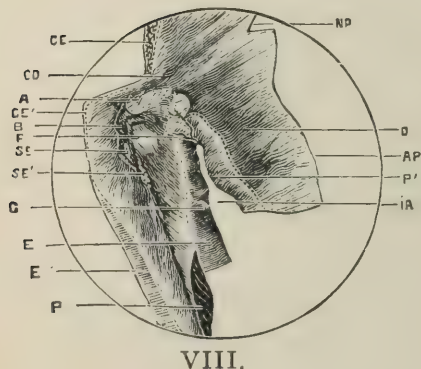
The lingual aspect, as shown in Fig. 2, is nearly normal, the crown suffering slight loss both axially and mesio-distally.

The distal aspect, as shown in Fig. 3, shows a gain in the crown labio-lingually, but great loss axially both at incisive edge and cervical margin. The direction of the root is labially, the cur-



DESCRIPTION OF FIG. VIII.

Ce, cementum; Ce', apparently structureless cementum of the neck; CD, condensed dental tubuli; A, area of distorted tubuli; B, billows or undulations in dentine, due to compression; F, fractures in enamel; Se and Se', secondary dentine; G, globule of ill-calcified enamel; E and E', enamel; P and P', pigmentated area; NP, normal pulp chamber; D, dentine; AP, abnormally developed pulp horn; IA, invaginated area.



vature showing the great stress to which the parts were subjected at time of traumatism.

The occlusal surface, as shown in Fig. 4, would suggest any other uses than those for incisive purposes. It is nearly round, the edges are very smoothly turned, and the center forms the opening leading within the crown to some distance.

Diagram No. 5 shows the specimen with part of crown re-

moved. The pulp cavity upon the lingual surface appears normal, but the labial surface is forced inward by the projection of dentine, into its area at a sharp angle.

The extent of the injury now appears :

The cul-de-sac formed by the intraversion of the ameloblastic layer extends rootward and labio-distally. It consists of a central area, the narrowest diameter of which, labio-lingually, to be of equal size to the pulp chamber itself ; its broadest diameter to be about one-third greater than the orifice at the occlusal surface. It becomes constricted incisally, the lingual wall almost entirely filling the opening, a fine instrument may be passed through this opening at mesial and distal commissures only as shown in Figs. 5 and 7.

At the base of the cul-de-sac as shown in Fig. 5, appear prolongations showing a honey-combed appearance of the substructure. Under low powers of the microscope, these appear to be a part of or detached portions of the enamel organ, surrounded by its product—a thin formation of enamel.

By a removal of nearly one-half of entire crown, we obtain Fig. 6. We now find cavity area diminished, more constricted at orifice and the base to become prolonged, extending nearly to cementum and connecting with the apparently detached portions of enamel organ as shown in Fig. 5.

A superficial removal of enamel and dentine from distal surface, as shown in Fig. 7, shows that the cul-de-sac now extends to, and becomes in direct contact with, the thin layer of cementum, and by lateral expansion forming a floor of appreciable width.

In the absence of previous history of the case, a glance at the condition of the parts at time of injury will prove of great importance. Previous to six months of age there would be no erupted tooth at this point. Force causing an injury at this time would be distributed over a larger area of the superior jaw than if meeting a resistance at a single point as upon the edge of an erupted deciduous incisor tooth, and if such were the case the adjoining incisors would be participants in the abnormal condition, sharing equally or in part, the result of the direction of the force. The condition of the remaining permanent incisors being normal, however, it is fair to presume that the force fell upon a single point of the incisive edge of the deciduous incisor, producing the conditions herewith met.

The time of the injury would then be after six months, and

previous to twelve months of age, or the time for calcification of the permanent central incisor teeth, if it were not for the indications at the floor of the invaginated area. The distinct lines of fracture shown at Fig. 8 indicate a progress of calcification at time of traumatism, thus giving definite time for injury. This according to the researches of Prof. C. N. Pierce, would be at twelve months.

At this time the temporary central incisor has become calcified nearly throughout its entire length, a small fragment about one-tenth remaining uncalcified at the apical end. This condition of the root at this time presents a formidable weapon to be driven into the surrounding soft tissues, with its tapering sides and flattened apex, roughened by condition of incompleting development.

Accidents to children's teeth usually result from a blow delivered in front of the child upon the plane of the teeth or somewhat below it. The case under consideration shows a force delivered upon incisive edge of deciduous central incisor, driving its crown inward and upward and the root upward and outward and slightly toward the median line.

Immediately upon withdrawal of the offending tooth from the imbedded position, the resiliency of the soft tissues permitted the return to place of the several parts of the permanent dental germ, in varying degrees, dependent upon the amount of injury sustained; the greater degree of pressure in the deeper tissues, and the "heaviness" of the parts due to the impregnation of the tissues with lime salts.

The force of the blow by the presence of the deciduous tooth in place, had projected the ameloblastic and odontoblastic layers far into the substance of the subdermal tissues, giving an irregular surface to the sides of the invaginated area, but forming at the base a roughened and deeply indented surface. The subsequent formation of dentine in this crushed mass shows a delirium of dentinal tubuli which it is impossible to represent in diagram No. 8. Areas of normal tubuli terminate abruptly in areas of tubuli at right angles to their direction or in areas at other and varying angles.

Midway between the cul-de-sac and the commencement of enamel at the neck of the tooth appear billows or folds of dentine between which are isolated centers of secondary dentine. The darkened portion extending from pulp chamber toward neck of tooth is composed of dentinal tubuli in great abundance due to the condensation of a mass of odontoblasts into a contracted space, too limited for them to perform calcification normally.

The enamel prisms, within the invaginated space, present a roughened surface in places, more especially noticeable at points opposite greatest pigmentation. This is probably due to the destruction of Nasmyth's membrane at these points. At the same time ameloblastic and odontoblastic layers become ruptured, permitting a hæmorrhage from the papillary layer of the dermis, which by infiltration caused the varying degrees of light yellow to deep brown pigmentation observable in the enamel.

Upon the walls of the cul-de-sac appears no decay. Although the cavity contained a mass of dried organic matter in such condition as to be impossible to make careful microscopical examination of its nature, and with the free access afforded to the fluids of the mouth, the integrity of the enamel surface is maintained. This abnormal condition is especially interesting as it so closely resembles the "star" in the teeth of the horse, with the exception that the latter is protected by a thin film of cementum.

GOLD FILLINGS.*

BY F. H. SKINNER, D. D. S., CHICAGO, ILL.

The application of rubber dam and methods of preparing cavities has been so thoroughly discussed by men so many years my senior in experience and ability, that by the suggestion of Dr. Nymann I have decided to let that branch of the subject of gold fillings almost entirely alone; and, supposing the cavity is ready for the reception of gold, shall dwell upon that branch, taking up typical proximate cavities. I will first say that in all cases of proximate cavities separation is absolutely necessary. In bicusps and molars the margins must be so cut, that after the filling is in, the line between gold and tooth structure will be self-cleansing, or at least easily cleaned with the tooth brush, and so that this same line will in no place come in contact with the neighboring tooth. If the cavity does not extend far enough toward the gingiva to avoid this latter complication cut sound tooth structure enough away so that the cervical margin of the filling will be easily accessible with a tooth brush, or will be entirely covered by the gum when that part of the human anatomy is in its proper place.

We will now consider proximate cavities in incisors. Taking a

*Read before the Odontographic Society, April 13, 1896.

pellet of gold about the size of Rowan's three-fourths or smaller, if the size of cavity demands, it is placed over the linguo-gingival groove. Very finely serrated or smooth pluggers and small in diameter, with hand pressure gently press into the groove. This first piece is not condensed much. A second pellet of same size is then annealed just a little, and placed on first pellet and condensed more. A part of this second pellet usually extends over the linguo-gingival margin, or down toward it. This second pellet should with light malleting or hand pressure be fairly well condensed. In this way pellet after pellet is placed in the cavity, completely filling linguo-gingival and labio-gingival grooves and covering the gingival margin. By the time this is accomplished there is no danger of any rocking or loosening of gold already intact. Each pellet of gold will now be placed so that it extends slightly outside of the lingual border, and so that each piece extends more and more toward the cutting edge of the tooth, or what our friend Dr. Woolley calls, "crawling the gold." Each pellet as it is placed should first be malleted against the wall of the cavity, with a small smooth or finely serrated point; then the part extending down over the lingual margin should be malleted against, or *wrapped around the margin*. For this, narrow, finely serrated foot pluggers, properly shaped to reach the required distance and angle should be used, and all malleting should be done from the labial side of the tooth; for the lingual portion can never be properly built after the labial is completed, unless in cases of irregularities. Therefore keep the gold well down and build the lingual wall complete and full as the filling progresses. Once the lingual wall fully covered and contoured, we have a very simple cavity which can be filled without difficulty, the only care being to thoroughly condense gold against the walls and have margins well covered. For durability of finish the last few pellets of gold should be some of the various brands of sheet gold, or better still, heavy rolled gold, say number thirty, and should be thoroughly malleted. The next step will be to grind nearly down to the tooth with stones, or disks or diamond points, the labial and lingual borders. Then with narrow strips, so as not to cut off the contour, finish down the gingival border, and then the border near the cutting edge.

Now to make sure there are no soft places in the filling, steel burnishers should be used. This done, the filling may be brought down to its proper shape with coarse strips, then use the medium

strips and last a very fine one : and to give it a final polish moosehide cones or chamois skin disks and rouge is used. As smoothness comes with high polish, too much pains cannot be taken in that direction. The filling, when finished, should be so contoured that nothing but the gold is in juxtaposition with the next tooth. So much for incisors.

We will now take a lower, right molar. Examine and keep in mind the articulation of the opposite tooth and build the gold accordingly, supposing the cavity to be on the distal surface and good separation has been obtained. I never groove the full length of walls. A slight dovetail in the gingivo-lingual and buccal angles avoiding any groove across the gingival wall or bottom of the cavity ; and a couple of grooves or steps run out lingually and buccally on the occlusal surface, leaving all the walls with sound tooth structure clear to the margins. Of course, if the fissures require cutting out that gives all the retention necessary on the occlusal surface, and the aforesaid steps are omitted. The essayist never uses a matrix when he can build a wall without it ; but when necessary, his favorite matrix is a piece of 22 karat gold thirty gauge, bent to fit the imaginary wall, and held in place by driving a small orange wood wedge in the interproximate space a little above the gingival margin of cavity, so that when the gold is malleted to place the matrix will spring out and the gold spread over the margin. This assures a good joint or contact, and the matrix is never used over two-thirds of the way up. The Ivory matrix is also very servicable and much easier adjusted.

Noncohesive gold is now used for about one-third of the way up, and I never use a larger piece of gold than will go into the cavity without crushing out of shape. Beginning with filling grooves, then bridging across floor of cavity, and carefully condensing each pellet as it goes on, for while gold may spread a little I prefer to mallet each piece to its place ; for while there may be a little spreading of gold in lower part of filling from malleting on upper part, very few of us condense our gold so that it will not stand a little more condensation, and not hurt the filling when viewed from the standpoint of permanency. As a rule we have to resort to some hand pressure in building up the buccal margins and the mesial and buccal walls. When the cavity is about one-third filled gold should be annealed, and nothing but cohesive gold should be used in steps, or whatever form of retention is used in the occlusal

surface. Small pellets should be used to insure thorough condensation, and the walls, if anything, should be kept a little fuller than the center of cavity, and whether hand pressure or some of the various kinds of mallets are being used, always direct the force toward the nearest wall or margin to which you are working. Narrow foot pluggers so shaped as to get pressure in proper direction are used on margins; and round points on walls and inner part of cavity, and great care should be taken to thoroughly condense gold against mesial wall and margin.

By this time the operator has his cavity filled, the margins all well covered and gold contoured out until it touches the next tooth. The occlusal or top part of filling is of rolled gold, or better still, shade one of platinized gold, which takes a better, harder and more lasting finish than the pure gold. With a safety side saw make room for a strip to get down to the cervical margin, and with coarse narrow strips, narrow enough so as not to effect the contour, finish down the cervical margin. A right angle disk holder or mandrel will be found very serviceable in getting at cervical buccal and lingual margins; *but never try to put a disk down from the top*, for by so doing you spoil what you have been trying to make, i. e., a nicely contoured filling. Proximate trimming files are very useful in finishing down the cervical margin, especially if the proximate side of the tooth is somewhat concaved. This condition is more often found in bicuspid, however. As a trimmer never leaves a smooth surface, when strips will not reach I use steel burnishers to make smoother. Cuttlefish or French polishing strips will give as high a polish as you can get to this part of the filling, that is, so far as the essayist knows. The lingual and buccal margins can usually be gotten at very nicely with disks. This part finished, the rubber dam should now be removed, and filling ground to proper occlusion. Then go over thoroughly with steel burnishers; diamond points and wheels will now be found very servicable in cutting down rapidly and still will not mar the filling. Fine sand or emery disks can frequently be used to good advantage here also, and last, a moose-hide wheel or disk and tripoli, then rouge will give as high a polish as any one will ask for. In using strips or disks cold cream vaseline will be found very servicable as a lubricator, preventing so much of the rasping sound, and keeping the filling from heating rapidly, and has a more pleasant odor than oil or common vaseline. In partic-

ular work and small cavities the hand mallet in the hand of the average operator will do less damage to margins than any other mallet, and no hand is so well adapted to handle the mallet in perfect harmony with the plugger as the hand of the operator himself. Let the assistant pass the gold, and even this the operator would better do sometimes himself. Good gold fillings take time and can only be put in about so rapidly if properly and thoroughly inserted.

In conclusion will say that a careful, thorough operator will make a good filling out of a cavity not very scientifically prepared, provided the margins are properly shaped and it has some retention, but the most scientifically prepared cavity will be a failure if the gold is put in by a poor or careless operator.

This does not imply that the greatest care should not be exercised in the preparation of the cavity as well as in the insertion of the gold.

MOLECULAR ATTRACTION IN ROOT FILLING.*

BY H. W. ALLWINE, D. D. S., OMAHA, NEB.

Gentlemen: At a former meeting of our Society you requested me to present experiments, and prepare a paper on the above subject. I take pleasure, therefore, in reading this paper, and presenting for your examination, some of the results of my work.

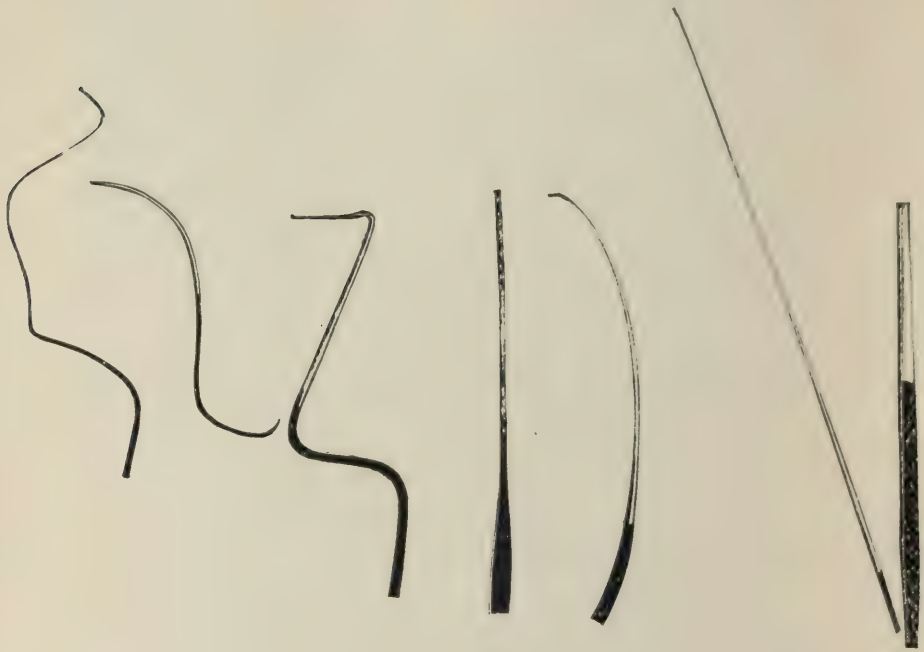
That I might clearly note the action, in small tubes, of various materials used in filling roots, I drew out small glass tubes, conically shaped, varying in size and form, as do root canals. I call them tubes, but you will notice that they are cone shaped, as are root canals. Some are large, while others are so small that the smallest broach cannot be passed into them.

In using roots of teeth for experimental work, the progress and result of the work cannot be seen. Some of the material may appear at the apex, while, at the same time, some of the root may remain unfilled.

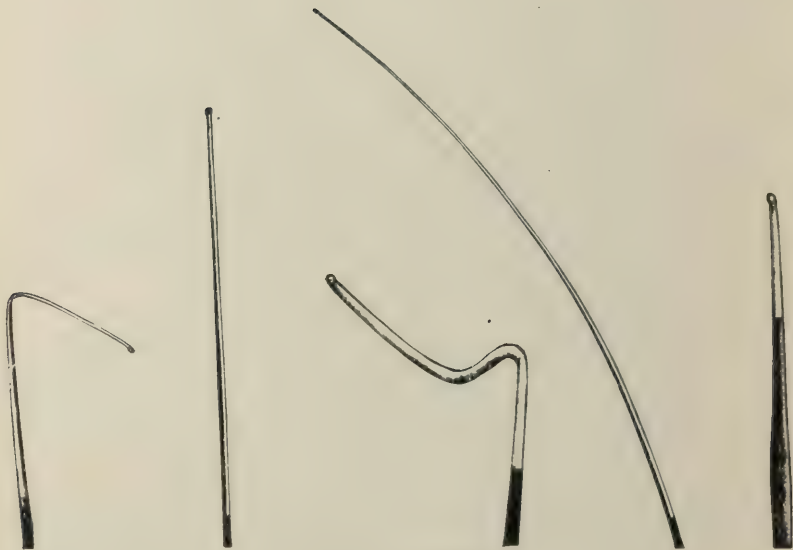
Before discussing the various filling materials, I wish to prove to you, by ocular demonstration, that capillary attraction, a form of molecular attraction, does not come to our aid in root filling. We find capillary attraction exists only when the tubes are open at both ends. Root canals are practically sealed at one end. I have

*Read before the Omaha Odontological Society.

here a number of variously formed tubes. Some are open at both ends, while others are sealed at one end. I now place the open ends of the various tubes into this colored water. Notice how



CUT 1—OPEN.



CUT 2—CLOSED.

rapidly it rises through the entire length of the tubes open at both ends, while it does not enter at all the tubes sealed at the outer end. This is an important observation, because it is at variance with the

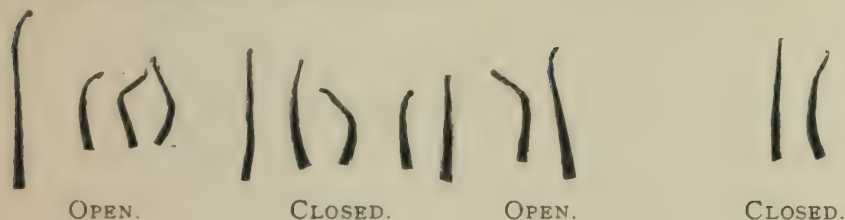
teaching of some of our prominent writers. One, even in his enthusiasm for salol, goes so far as to tell us, in his Journal, that he squirts it into root canals, indiscriminately, with a syringe. I am not here to state that others cannot do thus and so because I fail therein ; but I do say that it is contrary to nature's laws—science ; and I cannot do it. Large tubes sealed at one end, into the entire



CUT 3.

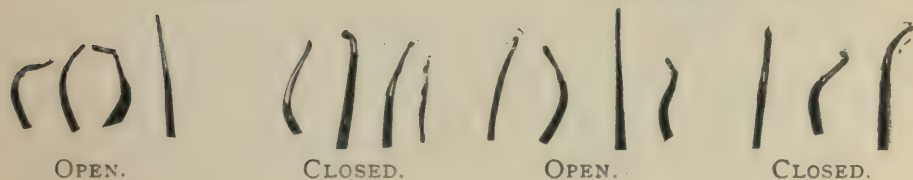
Thick chlora-percha without points.

Thin chlora-percha.



Salol.

Oxychloride of zinc.



CUT 4.

length of which the needle can be passed, may be filled nicely by a syringe with liquid, by passing the needle into the entire length of the tube, pressing on the piston, and gradually withdrawing the needle.

Before reading further, I will demonstrate these truths of science with the tubes and syringe here at hand. You will note how readily the liquid passes into the tubes open at both ends.

Notice, too, how easily I fill the tube sealed at one end by passing the needle into the entire length of the tube, pressing on the piston, and gradually withdrawing the needle. Now you will observe, I pass the needle part way up this sealed tube, press on the piston, and the liquid is forced backward, leaving a column of air in the tube beyond the needle point. Why is this? It is a law of liquids, that, if left alone, they assume a spherical form. When the first drop of liquid comes to the point of the needle, it becomes spherical, touches the walls of the tube, sealing in the column of air beyond. This is likewise true in root filling.

It will be seen readily, therefore, that these sealed tubes can be filled only by working the filling material in with an instrument. Here molecular attraction, or adhesion, comes to our rescue. By using a material between which and the side of the tube there is adhesion, we succeed. By drawing the broach backward and forward, we carry some material in each time that adheres to the walls and that which is already in. Thus we gradually extract the air and fill the tube. With me it is impossible to do this with material having no adhesion for the tube or with liquids. They are carried back and forward with the broach. You have all noticed these facts in the use of various materials in your daily work. By the use of these glass tubes, I can note every movement of the various materials within the canals.

The reading of a paper on salol, and the discussion thereof, at a former meeting, suggested this paper and these experiments. Though I used salol sparingly yet I was its friend and advocate. This was not because I *knew* of its positive merits, as were claimed for it, but because a number of good men were so loud in its praise. I am completely disappointed, forced to be so. In large tubes it can be used nicely; but so can every other material that I used. It is the most difficult, according to my observation, to insert into canals of various forms and sizes as we find them. Being in liquid form, the particles move freely backward and forward with the broach. The air is not extracted, but is mixed as it were with the salol, leaving the solid salol in sections. There is so much uncertainty of its action in the tubes, at my hands, that I would be afraid of it as a permanent root filling. I would find hope only in its antiseptic property.

A prominent writer and authority on dental subjects places a

gutta-percha point on a root canal plugger, softens it in chloroform, floods the canal with chloroform, then presses the point into the canal. This method is good for filling large tubes, leaving chloroform out of the tubes, however. In small tubes it does not work at all unless the point be thoroughly softened, then it is simply a case of chloro-percha filling.

In my experiments, an excess of chloroform in the tubes thins the filling material too much; and, after evaporation of the chloroform does not leave the tube filled. By softening the small end of a gutta-percha point in chloroform, I can press it to the end of tubes nicely. The tube may then be filled with any material. In this way I get positive results.

As we must depend upon the sense of touch on the part of the patient, as to when the canal is full, the conclusion reached in my work on the glass tubes would make it imperative that the canal be not flooded with any medicament, as it is forced ahead of the filling material proper. This is felt by the patient, and we force no more material into the canal. When the liquid is absorbed the root is unfilled. I believe many roots are thus filled, and the operator congratulates himself on his grand success (?).

With oxychloride my work was not a success in tubes too small for my broach. It hardened so that I could not force it ahead, to get positive results.

With chloro-percha my experiments were more satisfactory. Results with this material were more positive, when the chloro-percha was of the proper consistency. When used thin, even though the canals were quite full, the filling was very defective after the chloroform had evaporated. The gutta-percha was then separated into sections, and even these were not solid. It can be forced into the smallest tubes when quite thick—almost stiff—I thus use it.

When filling sealed tubes, the elasticity of the air and gutta-percha was quite apparent, in that the filling material tended to come out of the tube perceptibly, leaving a small space unfilled. I am inclined to think this same tendency exists in the filling of root canals. It may be retained, as desired, by cement in the pulp chamber.

The above are all the filling materials with which I experimented thus far. It is needless to say that I find canals in which

I am unable to do work satisfactory to myself. We all find them. For the treatment of these we look forward, to the mummifier, hoping one may be discovered whose good effects will be permanent.

I thank you for your kind consideration, and leave the subject for your discussion.

DENTAL OPERATIONS FOR WOMEN DURING THE PERIODS OF MENSTRUATION AND GESTATION.*

BY I. P. WILSON, D. D. S., BURLINGTON, IOWA.

There are certain physiological as well as pathological conditions that deserve careful study and level headed judgment on the part of the dental practitioner.

The physical condition of patients has much to do with their power of endurance, and their ability to withstand the taxing operations of the dental chair.

So much has this fact impressed itself upon my mind of late years, that I have felt it not out of place to call the attention of this association to the subject of this paper.

When a physiological condition exists where nature is taxing herself to the utmost in fulfilling the laws that govern the animal economy, when vital force must be concentrated for a time in establishing or accomplishing functional work, when nature suspends operation, as it were, in the various parts of the human organism in order that some particular function may receive special attention and support, as is doubtless the case with women during the periods of menstruation and gestation, it behooves the dental practitioner to study carefully those physiological conditions that nature has imposed upon woman.

Especially is this true when we remember the strangely sympathetic condition existing between the genital and the dental organs.

The great sympathetic system of nerves engages oftentimes in secret service, and baffles the skill of the most skillful.

Connected, as this system is, with all the other nerves of the body, danger signals are often displayed so far away from the seat of danger, that it is exceedingly difficult to associate cause and effect.

Uterine irritation not unfrequently sends out messages of pain to remote parts of the body, and the terminal branches of the fifth

* Read before the Iowa State Dental Society.

nerve often receive these impressions, and the dental organs are suspected as the cause, while all is apparently calm and serene at the seat of the difficulty.

The periods of menstruation and gestation both frequently produce an irritable condition of the entire nervous system, and at such times very misleading symptoms are liable to appear, so that great care should be taken not to mistake these symptoms for the real cause. The afferent nerves have carried impressions to the brain from the source of irritation, and the efferent nerves have taken up those impressions and carried them to other nerves and their terminal branches.

There is a general disturbance of the entire nervous system, and the patient is keenly sensitive to pain. Dental operations at such times should be avoided. Nature has a work in hand that should not be interfered with, by imposing additional burdens upon her that she is not, at the time, able to bear.

When this functional work, however, is not disturbed by pathological conditions, little or no inconvenience is experienced; but if an abnormal condition exists, every weak part of the body, especially the dental organs, must pay tribute. And, because of this, we are very frequently called upon, at this inopportune time, to relieve pain, which should be done by palliative treatment.

The administration of an anæsthetic during the "period" is by no means satisfactory. If the patient is at all inclined to be hysterical a scene may be expected.

I have also met with the most amazing cases of hysteria when attempting to extract or fill sensitive teeth at such times. The same patients at other times would have sufficient will power to say to that provoking disease, "Get thee hence, Satan."

I desire, also, to call attention to the importance of guarding carefully against the use of painful appliances, so frequently employed in orthodontic practice for young women or girls who are approaching the important, if not critical period of puberty. Correcting irregularities of the teeth should not be a very painful operation, if skillful appliances are employed, but the continual pressure necessary to accomplish the work is liable to cause considerable annoyance to the young patient, and is sometimes quite taxing on the nervous system. The work of art should, therefore, if possible, precede the physiological change that nature has in store for the blushing young maiden.

Taxing operations in filling teeth with gold during the establishment of the monthly period should, also, be carefully avoided.

The teeth at that period in life are usually soft and sensitive, and should be filled temporarily with cement or gutta-percha, and thereby more satisfactory service will be rendered to all concerned.

Doubtless every practitioner has observed how much better the same patient can endure the operation of filling teeth at some times than others. While this is true of both sexes because of any physical or mental exhaustion at the time, it is especially true of women during the catamenial period.

We have frequently had lady patients remark by way of apology for their nervousness, "I ought not to have had this work done to-day, I am not feeling very well." At other times they will plainly intimate the cause of their unusual nervousness.

Mothers will wisely avoid making appointments for their daughters for dental operations, or, if they have made them, will request a change of time when they find that nature and art are likely to conflict. This ought always to be done, and dentists should readily accede to these requests, and encourage such precaution on the part of a thoughtful mother, or patient.

Extracting teeth also should be deferred to a more opportune time, employing, of course, palliative treatment for temporary relief.

Observations have led me to believe, too, that excessive hæmorrhage is more likely to occur during the menses than at other times. Especially is this true with persons of a hæmorrhagic diathesis. We may readily understand how this may be true while nature is engaged in this particular functional work, which brings with it a peculiarly relaxed condition of the entire system.

Dental operations for women during pregnancy cannot so well be postponed. Indeed, it is all important that teeth should not be allowed to ache during gestation. Patients are often advised, even by their family physicians, not to have anything whatever done with their teeth while in that condition. Such advice is erroneous and often results in unnecessary suffering, and at a time when the mother's vital force should not be wasted because of protracted pain, and sleepless nights, as is too frequently the case.

If a dentist deserves the confidence of his patient at such a time, he should enjoy it as fully as the family physician, that he may treat the case intelligently and safely.

I have never to my personal knowledge, had any unpleasant results from operating upon the teeth of pregnant women when I have previously been advised of their condition.

On one occasion I filled several very sensitive teeth with gold for a lady at about the third month. I was not aware of her condition. She was a brave, courageous woman, and was determined to have the work completed at one sitting. She exerted her will power to the utmost, and for a half day sat in my chair with her nerves strung to the highest tension. An abortion was the result. Comment is unnecessary. I was ignorant of her condition, or it need not have occurred.

If a woman has once aborted, and has not afterward given birth to a child at full time, any painful operations upon the teeth in a subsequent pregnancy is exceedingly perilous. Especially is this true if miscarriage with the woman has become a "habit." But protracted toothache and unrest are also liable to produce the same results. So if the woman is suffering, something must be done, and what is done must be done intelligently. First allay her fears and quiet her nerves by assuring her that no pain will be inflicted. This she must believe before going to the dental chair, that all dread and fright, so far as possible, shall be removed. For dread, and fright, and distrust (because of your having deceived her before), and the sight of blood, and a display of instruments, are dangerous factors in bringing about unfavorable results.

If there is ever a time when a woman should be particularly careful of her teeth, it is during the periods of gestation and lactation.

But here I have introduced an important addition to the subject of this paper. Gestation and lactation are very intimately associated together, so that the latter deserves, at least, to be mentioned in this connection.

The new being during lactation, as well as gestation, receives its life support from the mother. That a somewhat degenerate condition of the teeth does exist at such times, must be granted by every close observer.

How it is, and why it is, that this is true, is an interesting subject for discussion, but does not properly belong to this paper. In a subsequent paper, however, I hope to call attention to what has hitherto been assumed as a fact, without being supported by

recorded observations, from which scientific deductions should have been made

If the teeth are found to be decaying rapidly during the periods above named, especially during the early part of gestation, it is exceedingly unfortunate to neglect them. They should be filled temporarily, and thereby bridge over a critical period that should be free from suffering and pain.

How often have we seen pitiable cases, where the poor mother was suffering excruciating pain from decayed teeth, that should have been filled at a less perilous time.

I have one other suggestion to make.

Operations upon the teeth of pregnant women should not be performed at a time when menstruation would have occurred had conception not have taken place. It is my impression that abortion is more easily brought about at the even months than at other times. I am not sure that I have medical authority for this statement, nor can I speak from extended observations, yet I have the impression that this is true, and in my practice have quite rigidly observed the precaution.

It is not often necessary to speak to our lady patients about the delicate affairs to which I have here called attention. Ladies are especially educated regarding such matters. After a few mothers have asked for our professional advice, their daughters and their lady friends will very properly be enlightened. And so gratuitous advice on any of these subjects should not be given by us unless necessary, and then there should be no hesitation in discharging our professional duty.

The time has passed when mechanical and operative dentistry alone demand our skill. The field in which we labor is widening and lengthening. In it are endless treasures. He that diligently searches for truth shall be richly rewarded.

That is one thing about our young profession that I like. Science invites us here and there to work out one problem after another that will relieve suffering humanity, and add comfort and satisfaction to the race.

The health of the people is enhanced, and the length of life increased, because of the sanitary results of intelligent dental practice.

The young man who fails in our profession, or in any other calling in life is he that folds his arms on commencement day, and

takes a lifelong rest. If I have succeeded in awakening an interest in a line of thought of a somewhat unusual character, and if the profession shall find suggestions in this paper worthy of putting into practice, and benefit result therefrom, I shall have gained my purpose.

PROCEEDINGS OF SOCIETIES.

ST. LOUIS DENTAL SOCIETY.

Discussion of a paper read before the St. Louis Dental Society September 3, 1895, by Dr. Adam Flickinger, "Sanitary Removable Porcelain Crown and Bridge Work."

(At the close of the paper Dr. Flickinger exhibited some models, and placed a crown in the mouth of a patient, thus practically illustrating his method of work.)

Dr. FLETCHER: *Mr. President:* I would prefer that you had called upon some one else, as I do not pretend to know much about this work. I have a furnace and have done some work, but principally with "jacket crowns," and it has been satisfactory. I did have some trouble at first, as the body was porous and became discolored with tobacco, and I had to remove some of the crowns and replace them, but have had no further trouble with the new body. So far as strength is concerned it has surprised me. I put on thin jackets and the shells did not seem much thicker than twenty-four gauge plate, yet have stood the hardest kind of usage.

I have experimented on porcelain bridge work very little and cannot speak on that intelligently, but I have been very much pleased with the paper and illustrations, and with the doctor's permission will visit him at his office and then think I can speak more intelligently on the subject. I have never done this class of bridge work, but I think some of the principles very good and that it will be improved when we are able to get Custer's electrical furnace.

Dr. FLICKINGER: I am using the Land furnace.

Dr. FLETCHER: I think the electrical furnace will be neater and cleaner, and that the porcelain work has a great future and will be used more extensively in a few years.

Dr. YOUNG: I have had very little experience in the line of porcelain bridge work, having only constructed two bridges of porcelain; they were failures and were finally replaced by gold bridges, because they did not have strength enough to stand mastication.

As to porcelain crowns, I use them a great deal, but I do not think it necessary to have this mode of removing them. The doctor seems to have displayed a considerable ingenuity in the arrangement of his work. When I read the notice I thought he was going to exhibit a bridge that the patient could remove. If we could construct practical bridges of that kind I think they would be satisfactory. Putting in bridges with large surfaces that cannot be cleaned is not satisfactory.

Dr. COYLE: I am very glad that I have heard this paper, but I am not much in favor of bridge work, however, I am in favor of anything that advances bridge work in the profession, and I think some of the things shown will be an advantage, but I do not think that every dentist can manipulate this work. I do not think that every dentist can put those bars in. I do not believe that I can do it myself, but I suppose Dr. Flickinger can, and I hope some day to learn. I hope porcelain bridges will solve the problem of bridges; but bridges are not a success in my estimation now, although they save the extraction of many teeth.

Dr. CONRAD: I agree with Dr. Coyle, it is a pleasure that we have this evening. I did not know that our friend Flickinger could write as good a paper as that and I hope that we can have more papers from him. Of course I do not agree with him. It is not expected that I should. Now of course, as Dr. Coyle said, it requires only an expert Flickinger or Coyle to do such work. I am not in favor of bars inserted in teeth but it has been practiced many years. They have had their day and are still advocated by some men, but bridge work has not been accepted as a success. It looks pretty but does not seem to have the stability that dentists want. The doctor spoke of some degree of lack of confidence in rubber work. I think rubber work the grandest blessing that has ever been given to the mechanical dentist, for without it the majority would have to do without teeth. I also believe in gold crowns where necessary, and I am an advocate of fixed crowns and bridges.

I believe that our worthy president thinks the question of bridge work is being very much reduced in importance, but I do not think it will go out of existence but that it has come to stay and that it will be successful, but I do not understand the advantage of this system in all cases. I do not see any advantage in the crown that the doctor inserted over an ordinary porcelain faced crown.

Fifteen years ago Dr. Fisher had White make some special crowns for him. These teeth were constructed for the purpose of fixing them on the roots by inserting a hollow pin and the screw was baked into the porcelain. The screw was made to fit and all you had to do was to insert your tool and screw your tooth into place. They were constructed at least fifteen years ago, and were unusually good, but they were not a success and were abandoned.

The objection to this in my mind would be the method of fixing the bridge into a cavity formed in the teeth. It might do if it were not for the moving of these teeth, but they will move enough to cause leakage. If the bar be inserted down to the neck of the tooth there would be a difficulty in fixing it. With Dr. Flickinger his method is undoubtedly a success and an improvement over Parmly Brown's method, but at present I am not prepared to accept it. I do not pretend to say that I can do as good work as other people.

In regard to the Downie furnace and Downie crown, I do not see their advantage. There are points of difficulty and the more necessity for crown work the more difficulty you have in putting this on.

Dr. EISLÆFFEL: Dr. Flickinger's paper was interesting. To my mind the crown that Dr. Flickinger makes is very nice. One feature that I like is, that if a tooth next to the crown should decay, as one often does, one could very easily remove the crown and fill the tooth without showing the gold, and do a first-class piece of work with ease.

In regard to the bridge work I have experimented a little myself, constructed similar to Dr. Flickinger's method of fastening the bar into the sound teeth with fillings, but I did not make a success of it. It was in the mouth five years, but I was very anxious to get it out for fear some other dentist might see it and criticise my work, and at last I got it out. I would not try again to put a bar into a tooth for it is not practicable in my case, nor do I think it will be in any other.

This method of making a crown or bridge work is nice, because it hides the artificial appearance.

Dr. FLICKINGER: I do not cut sound teeth, only teeth that have a cavity. I have in mind a doctor's family, a big fighting doctor known by most of you. He has a family of children that have a kind of teeth that I hate to see come into my office. They are as

soft as chalk and there is no possibility of doing anything with them and invariably, whatever you do, they lose them in time. Now when I place a removable crown in such a mouth I know that in a short time the patient will come to me to have another, and I am positive that before two years the teeth will be gone.

I have another case where I put in a Logan crown eight years ago, that is fulfilling its mission all right. The man was formerly a traveling man and visited a country dentist and had a tooth extracted, and now he comes to me to have it filled up. One of the teeth is decayed slightly, and if I had a removable crown on that root it would be easy to remove it and extend the work; now it is difficult to do that. If you try to cut off the band you are likely to cut up the root so that you spoil it. It is only in such cases that I would do that. Where teeth are in first class condition and have many years of future prosperity, I would not use a removable crown but would use a stationary crown.

The one or two cases illustrated have stood all the wear and tear so far, and I do agree with Dr. Conrad altogether in regard to the movement of teeth. I think if the anchorage is down next to the gum there is very little movement and should it become necessary, it is a slight matter to drill down next to the cervical edge and thus meet all requirements.

Dr. COYLE: I have heard the subject of educating the people discussed time and time again but have seen no effort made to do this, and I think some effort should be made to educate the public.

We do not like to run down the work of any other dentist, but we know many times that work is not perfect and there should be some method of educating the public, for it takes too long to do it by individual effort. We will all be dead before it can be accomplished in this way, and the people should be educated so that no shoddy work can be put upon them. That is the only way to elevate the profession so that the cheap men will have to withdraw.

Dr. CONRAD: You do not have to call upon me this time. I wish to say by way of explanation, most of you know that this method has been advocated, and every little while it breaks out anew. In regard to the filling of adjoining approximal cavities, you may put in just as good a filling as you want in adjoining cavities, and, just as sure as you live, one or the other of those fillings will become loosened. You must take the movement of teeth into consideration in filling, crowning and bridging teeth.

But a man to get up before a body of intelligent dentists and say that he does not care anything for the public, and that the dentist is only working for the money that he sees in the business! He does not believe it and you do not believe it. It may have been so years ago, but any profession that loses sight of benefit to the public loses sight of benefit to the pocket, and that is a principle no one should ever allow to enter his mind for it will corrupt not only himself but the society. It is the interest that we take in the public, in every piece of work that goes out of our hands that makes us advance and makes us feel sometimes, when we see that we do not make as much money as some other specialist, that we are repaid somewhat by the good we are doing humanity. And I must say that rubber work has been a blessing to humanity and to many dentists that work outside of the wealthy communities, and the better work they do the better it will be for both parties. It requires just as much skill to construct a rubber plate as it does a gold plate or a crown.

They speak of the ease with which you can remove this bridge. It is just as easy to remove a fixed bridge as that. There is danger in removing any of them. A gold bridge or any other will break. It is due to the peculiar articulation. The teeth are not always perfect and that must be taken into consideration. There is no trouble in removing and repairing one. All you have to do is to set it with gutta-percha and set it well. Line the cap with gutta-percha and set it with cement, and it will remain just as fixed as if all cement, and you can remove it just as easy as if there was nothing but gutta-percha alone. You must not think that everybody puts on bridges that will be satisfactory. I do not think so, and then you must not imagine that everything you put on will come off, and then again, if you have a desperate case, a tooth fractured until the line is away below the process, you certainly cannot fix it that way, and if you think you can put it on that way you are building on a foundation of sand. You must build a crown on it and it will be good.

Dr. FLICKINGER: The case just mentioned by Dr. Conrad is the one exactly that I described in my paper, the case to which I referred as being in the hands of a number of prominent men, and all constructed on the plan that the doctor stated. They all made failures, the tooth came off after awhile, and knowing full well, if I followed the same principle I would

make the same mistake, I devised this method and it has proved satisfactory so far. I saw the case only a week ago and had occasion to remove the crown because I wanted to fill a neighboring central and I found it in good condition and doing the service I intended it to do, and that is the reason I argue this construction.

Dr. COYLE: Everybody is in the profession for the money that is in it. At the same time there is some pride in giving satisfaction to the patient, and I would work for some people for nothing much more readily than for others for money, because the work is appreciated and the people are pleased and think there is no person as good as you are and that is always encouraging.

NOTE.—The paper of Dr. Flickinger opens up a new field in this line, which it seems may be profitable for many to use. Try it before condemning it.—[EDITOR.]

CHICAGO DENTAL SOCIETY 1896-97—PROGRAMME.

May.—1. Should not the appointment of dental examining boards be under the control of the State Dental Societies? Dr. G. J. Dennis will open the discussion. 2. Should not the granting of certificates of qualification by examining boards to nongraduates be generally abolished? Dr. Theo. Menges will open the discussion. 3. What results are to be expected in replantation or transplantation as a means of treatment of chronic phagedenic pericementitis? Dr. A. W. Harlan will open the discussion. June.—Dentistry in the Orient. Dr. R. H. Kimball. Orthodontia. Dr. C. S. Case. October.—Porcelain up to date in its application to dentistry. Dr. W. H. Taggart. Pulpitis. Dr. L. L. Davis. November.—Some Indications for Systemic Medication. Dr. E. L. Clifford. Pyorrhœa Alveolaris. Dr. A. W. Harlan. December.—Dr. Truman W. Brophy. ———Dr. Charles P. Pruyn. January.—Dr. A. H. Peck. The Dental Museum. Mr. W. Booth Pearsall, of Dublin. February.—Toothache and its Treatment. Dr. H. A. Costner. Anæsthesia of the Dentine with results of Experiments. Dr. J. O. Ely. March.—The Removal of Deposits Upon Teeth. Dr. I. A. Freeman. The Manufacture of Artificial Mineral Teeth. Dr. J. Austin Dunn. April.—Annual Meeting. President's Address. Election of Officers.

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THIRST FOR A DIPLOMA.

An insatiable thirst for diplomas seems to pervade the whole empire of Germany from the number who flock to our country to get a D. D. S. Most of them want the said diplomas in varying periods of from two weeks to six months. A public sentiment ought to prevail, to prevent such an itching for a D. D. S. As the D. D. S. does not carry the right to practice in Germany of what value is it to the holder? These easily acquired titles do not represent anything except the cost of obtaining them—and transport to and fro. When there are so many dental schools in Germany why do they not obtain these “students” and give them something for their money—in a practical way, instead of causing the flow of gold to this country. We protest against such “students” coming over here and then crying out that they do not get what they come for, i. e., a diploma.

Germany has gone diploma mad in the D. D. S. line and she ought to have an inquiry, a jury so to speak to sit on her. What she ought to do is to make some plan of lifting up her “tooth artists” and “tooth workers” and then they would not fall such easy prey to the imagined benefits that a parchment D. D. S. would give them, our students do not go to any country for diplomas—they stay right here at home and earn them. Go thou and do likewise, unless you want to work for a D. D. S. just as our boys do. Those other diplomas from Delavan or other sources that are not based on good hard steady work we disclaim, disown, despise and say they are worthless.

We suppose that the fall or autumn season will see the usual

number of non-English speaking "students," who will want to get the usual diploma in the spring of '97 in spite of the fact that the applicant cannot understand "English as she is spoke." We do not wish to say one word against the searcher after knowledge, but we protest again that the mere searcher for a diploma ought to be discouraged on all sides and for reasons which must be plain to every intelligent reader of this journal.

A SEDATIVE AND HYPNOTIC—FL. EXTRACT JAMAICA DOGWOOD.

Very recently I was brought face to face with a genuine case of hysteria, so pronounced that it seemed impossible to fill teeth for the subject of it, a lady. In looking over my medicine case for something to use to quiet the patient, I concluded to try the fl. extract of Jamaica dogwood (*piscidia erythina*.) As the usual dose is from one-half to two fluid drachms, I concluded to try a smaller quantity. Pouring fifteen drops in a glass vessel and adding about one-half ounce of water, I bade her swallow it. Within two or three minutes she became calm and after the lapse of five minutes she was perfectly quiet. I then adjusted the rubber dam and prepared three cavities in as many teeth—one in a superior bicuspid very deep and ordinarily very sensitive. Two hours in all were consumed in making the three fillings, one on the mesial face of a first bicuspid, the others in a first superior molar, mesial sulcus and the crown cavity in a third inferior molar. I was struck at once with the apparent fact that sensation in the teeth was dulled.

The effect of the hypnotic had not passed away in two hours. Since that time I have operated almost daily with cases of very sensitive teeth—notably labial cavities in cuspids and bicuspid with excellent results. So far, after three weeks' trial, I am satisfied that we have in Jamaica dogwood an agent that will not injuriously affect the stomach or brain; no more than a drowsy feeling is produced after the lapse of from ten to fifteen minutes. This generally passes away at the end of one to two hours. The appetite is lost for the succeeding meal. Cold air affects the teeth almost as keenly as though nothing had been taken to quiet the fifth pair of nerves. In most cases after the expiration of from fifteen to twenty minutes a ligature will not cause pain when it is tied around the neck of the tooth.

The local application of *piscidia* is also very beneficial, but it sticks to the cavity walls and is not easy to remove except with alcohol.

I have looked at the literature but have not found much of value concerning it. The following is taken from the *Extra Pharmacopœia*:

"The bark of the root of this tree, *piscidia erythina* is employed in the West Indies to intoxicate fish. In America it is employed to relieve toothache, and as a general sedative. It is said to be especially useful in allaying the cough of bronchitis and phthisis; does not interfere with expectoration, or lower the vital force. It is said to be an effective substitute for opium, to allay pain, spasm and nervous excitement, and to produce sleep. It dilates the pupil, dose twenty minims to two drachms. Is a good narcotic, does not cause headache nor constipation." Potter says, page 300: "It produces muscular relaxation, incoördination of movement, lowered sensibility, increased action of the heart and increase of the arterial tension by stimulation of the vaso-motor center. * * * On the brain its effects resemble those of opium, causing deep sleep without any of the unpleasant after-results. It relieves pain in less degree, however, than opium does, but its hypnotic action is greater. * * * It has proved in many cases almost a specific for neuralgia."

Most of the other works I have consulted are either silent or have nothing to say on the subject. I think that the safe dose lies between fifteen and thirty minims to produce the desired result. My patients are rather enthusiastic about it and I recommend a fair trial of it as a pain destroyer in the preparation of cavities in sensitive teeth. In most cases I have found that about ten minutes after taking a dose is long enough to wait for the effects. The face is generally flushed after taking a dose. So far I have not used more than one dose at a sitting. It is not unpleasant to take.

THE MISSISSIPPI VALLEY ASSOCIATION OF DENTAL SURGEONS.

The fifty-first annual meeting was held in Cincinnati on April 15 and 16. Several excellent papers were read, as will be seen by looking at the letter in another portion of this issue of the DENTAL REVIEW. This is the oldest dental organization in the world and its usefulness as an educator is still one of the factors in the present decade. Born in 1844, in Cincinnati, only once in its existence (1873), has its meetings been held out of the State of Ohio. It is believed that it has a long life before it. If any suggestion would be taken by the executive committee we would urge the necessity of getting out a strong programme about one

month before the next annual meeting. A good feature would be the assembling of at least one member of the first ten classes of the Ohio College of Dental Surgery with papers and reminiscences of the early work done by the members so that a feature might be made of the important work done by the different classes in those early years. One always feels at home in dear, dark, old Queen City of the West. Many memories cling around the old building on College Street (although the college now is located elsewhere), where the voices of Taylor, Taft, Watt, Smith, Clendenin, Richardson, McKellops, Morgan, Eames, Friedrich, Cushing and Allport were so often heard in the old days.

Now another figure so frequently present will gather no more (the lamented P. G. C. Hunt) with the early members. Every alumnus of the Ohio College ought to belong to this parent society for the purpose of keeping it alive to do effective work. We of the present day can hardly conceive of the really good work done in Cincinnati by Atkinson, Keely, Butler, Buffet, Ambler, Allen, Hunter, Rehwinkel, Hullihen, Cutter and Forbes. Indeed Harris was once a resident of Ohio, and many dentists in foreign climes were wont to gather in the old college halls prior to 1870, Jenkins, Field, Winn, Blount, Williams, Stout, Rawls and many others were active members in days gone by.

We appeal to the younger men of the recent years to go to work and build up the society to its utmost limit of good fellowship and active work. Make it a force once more in the dental world, and show that the birthplace of much that is good is still in the scientific ring so to speak.

In connection with the late meeting a memorial tablet was erected to the memory of Dr. James Taylor, the founder of the Ohio College. The following program was carried out in full :

Dr. James Taylor memorial exercises at the fiftieth anniversary of the Ohio College of Dental Surgery, April 16, 1896, at 3 o'clock at the college building. Music, glee club ; Invocation ; Rev. H. N. G. Taylor ; Address, Dr. A. W. Harlan, for the Alumni Association ; Address, Jas. J. Taylor, for the board of trustees ; Address, Dr. Jonathan Taft ; Music, glee club ; Address, Dr. J. S. Cassidy, for the faculty ; Music, glee club.

Dr. Taylor gave a history of the college ; Dr. Taft a sketch of the life of Dr. James Taylor, and Dr. Cassidy spoke of the faculty in a most feeling manner. Dr. Harlan gave a résumé of the work of the alumni and the influence of the college on education, literature and other achievements of the various classes.

DOMESTIC CORRESPONDENCE.

LETTER FROM CINCINNATI.

The fifty-third annual meeting of the dear old Mississippi Valley Association of dental surgeons has come, and like the tented Arab, stolen away into time and a footprint has been left on the sands thereof for the dear old lady, substantial with the weight of gathering years, though she may move with becoming decorum, always gives evidence of having passed this way.

Every heart throb from the dental body politic finds its cardiographic record in the minute book of this old society. I use the word "cardiographic" advisedly, for, as the heart acts before the pulse is noted, so the old society has been the first to move and the pulse wave radiated to the ultima Thule of the profession, where it becomes sphymographic.

It grieves me to hear the iconoclastic growler continually disparaging this society, harping upon its old age and ever predicting that this will be the last meeting—that its days of usefulness are over, that the world moves too fast and that time was.

Away with such pessimists; a wart that irritates the skin should be plucked out.

Men have come, men are coming, and men will come, and so the well-beloved old society will go on forever, still pursuing, still achieving immortal truth.

The meeting this year has not only resulted in much benefit to those who were present and participated in the discussions, but it has marked out work for the future in two distinct lines, and work too of a serious and laborious character which, when accumulated, will have the power derived from weight and momentum. I will mention first the experiments of Dr. L. E. Custer, of Dayton, O. These relate to cataphoresis, local anæsthetization by the electric current. His paper which appears in another part of this issue of the REVIEW, together with the illustrations will give the reader an excellent idea of the manner in which the current is so completely controlled.

The philosophy of cataphoresis is also set forth in a lucid style, plain, simple and to the point, a faculty which Dr. Custer possesses in an eminent degree. So true is this, that after hearing the paper and immediately thereafter witnessing the clinical demonstra-

tion in the college infirmary, the listener imagined he was dealing with a familiar subject and one upon which he had devoted much time and thought.

So far as the projection of cocaine in solution through dentine is concerned, there always remains the question, What part does absorption or capillarity play? And yet another, Is the solution decomposed by the electric current?

The clinical value of cataphoresis to the dentist will ere long be fully demonstrated, not only by Dr. Custer, but by many others who will immediately institute thorough and radical experiments. Shortly before this meeting took place, Dr. Buxbaum, of Cincinnati, stated before the Academy of Medicine of that city, that by the process of cataphoresis, anæsthetization, could be produced not only through soft tissue and dentine, but that the cocaine is driven through the enamel itself. This statement was either made from ignorance or inflamed enthusiasm, as the charitable will allow. Dr. Custer confutes it. He has found that the enamel is so poor a conductor, as to be none at all. He could not drive a forty volt current through it. So that forever sets at rest the idea of using the enamel as a conductor.

The other line of work mapped out for the immediate future, is outlined in a paper by Dr. H. C. Matlack, of Cincinnati. Proceeding upon the idea that syphilis, hereditary or acquired, may be a constitutional cause of pyorrhœa alveolaris, he examined some twenty cases in the Cincinnati Hospital and reported upon them. It is his determination to make a clinical study of this feature of this exasperating disease and so tabulate his material that he will be enabled to offer the profession a tangible result in the shape of statistics and we will then have definite testimony, pro or con.

This is work in the right direction, work as it ought to be done, original research, and Dr. Matlack should be encouraged, for the labor is immense and exacting in its details.

Dr. Harlan (what need to say of Chicago?) read a short paper on porcelain inlays and exhibited a large number of experimental root fillings from which we judge he estimates chloro-percha to be the best material for the purpose. He stated that some fifty or sixty operators in Chicago were requested to make root fillings. The result demonstrated the fact that salol is the poorest material, oxychloride of zinc the next. Upon inquiry, the writer was told that in all that small army of operators, not one had used iodoform!

A hundred other things of interest were said, shown and done at this meeting, all of which attracted and held the attention of those present, a hundred possibly, and which goes to show that this society is a vigorous one, useful as ever and not by any means cachectic.

The Mississippi Valley Association of Dental Surgeons took the initiatives in another matter of importance to the profession. It voted as a society, a membership fee to the Dentist's Protective Association, thus giving the latter the moral support of the oldest dental society extant. It is not understood by this action that the members of the M. V. D. A., became individual members of the other. Were all the other dental societies in the country to follow this example, a considerable amount of money would find its way into the hands of the protective association and also be the means of influencing many individual dentists to join. B.

ST. LOUIS, Feb. 29, 1896.

Gentlemen:—Received yours of February 28, 1896. My system of removable porcelain crown and bridge work consists of about twenty-five different forms of anchorages "all practical cases" and to do justice to the same, as well as to have the profession at large understand the fundamental principles of its construction "for which purpose the paper was read" it should be illustrated as completely as possible.

The inclosed sketches, if you observe, differ in their anchorages, and one or two of them would not convey an idea of the extensive applicability of the system.

For instance Case 2 has but one root remaining in the mouth ; while Case 4 has two, and Case 5 and 6 each, have but one, with small bar attachments ; Case 7 has no root, the bridge or girder bar being anchored to one dead and one living tooth by gold fillings.

The cases as sketched should give a general idea of what the system consists, and the many advantages it possesses.

Please send proof of article, before its publication, it will require some alteration in regard to the sketches.

Yours truly,

ADAM FLICKINGER, D. D. S.

1113 PINE STREET.

REVIEWS AND ABSTRACTS.

TO THE STUDENTS OF AMERICAN DENTAL COLLEGES.

It is an esteemed privilege to offer congratulations to the dental students of America upon their wisdom in electing to become dentists.

No other department of human endeavor offers greater fields for usefulness or greater reward to the faithful.

It is a source of gratification with our profession at large, to note the advanced methods of teaching and higher intellectual standard of our pupils to receive it.

The increasing number of dental colleges with their multiplicity of graduates make evident the fact of increasing demand.

If this be true under existing conditions, where a surprisingly small per cent of our population seek the services of a dentist save for the extraction of teeth, what would be the demand if all students could be effectually educated and conscientiously impressed with their sacred duty to their profession and the world, which eschews the extraction of teeth and uncompromisingly strives to preserve them.

A paramount question which should be discussed before the humblest and highest dental society is, Why do dentists extract teeth?

Why do those who have faithfully passed through the curriculum of a dental college and perchance made sacrifices of time and money, oft times drawing upon the resources of family and friends to acquire a full knowledge of the diseases which human teeth are heir to and treatment for their restoration, for a careful study of the Divine architect's infinite wisdom in their development for the physical perfection of creatures made in his own image? Why do they stultify the good name of dentistry by an assault to annihilate these priceless organs with forceps, and at the same time casting away that dearly acquired education for their preservation and any reputation which their profession is presumed to have as conservators?

Can any one dispute the importance and profit of a serious consideration of this question:

Does it occur to some of my listeners to ask, is this subject pertinent to ethics?

The reply to such a suggestion is that from long observation and study of the subject, extracting teeth, as practiced by many

dentists, is an evil which is synonymous with devil, and is a veritable satan stalking abroad in our profession seeking whom he may beguile.

This tempter has perverted a normal sense of justice and honor and so dwarfed self-respect, when yielded to, that nefarious methods are adopted for supposed gains.

These methods are the sandy foundations upon which is built the practice of the "advertising dentists." Printer's ink, gas bag and hypodermic needle are his chief material accessories; with these he decoys the ignorant, innocent and unwary to his selfish conscienceless course.

Whatever else his "dental dodgers" may claim for him in skill is *secondary* to "cheap painless extracting."

By these unethical and misleading methods the advertiser invades a community and aims to prejudice public opinion against regularly educated, reputable and established dentists, as extortioners and incompetents, by his guerrilla methods is willing to traffic in the good name of a profession from whose storehouse of lore he has drawn all that gives him a name which he now dishonors by his treachery.

He is willing to influence citizens to the belief that other dentists who are united and mindful of professional courtesy are a combination for the purpose of extorting unjustifiable fees—that dentistry is a trade and not a profession—that dental skill is overpaid and does not deserve the reward attending conscientious labor for years to establish and to which he would be cordially invited to share if he would add his mite to maintain that confidence and respect due an honorable profession in which he claims a brotherhood, and more to render a duty to humanity by a higher standard of skill in demonstrating professional truths—to educate and encourage the people to seek for their benefit the grand possibilities of modern dentistry.

In this light who will say his methods are not false?

The fallacious defense of the quack is that the established and regularly accepted plan for securing a practice is too slow—that he is too enterprising to wait, or his pecuniary necessities forbid it.

Thus he is willing to lower the standard of benefits to all others for his supposed individual gain—to subordinate every other high purpose to his selfish end.

Are not ethical questions involved in this course?

The next vain effort to vindicate a weak and wicked course is that the people will not accept treatment necessary for the conservation of diseased teeth, that they *demand* unconditional extraction; if one does not comply another will, therefore it is justifiable to secure the profit of this ill advised procedure.

"The people demand it." Do we admit that we should take our professional orders from those who are totally ignorant of the first principles in what many years have been spent by us in acquiring to become competent authority in regard to the proper treatment? Is it to count as nothing? Is this diploma won only for a license to conduct a Dental Slaughter House?

Shall our patients dominate our course of treatment against our knowledge of right?

Oh! dentistry, what sins are committed in thy name.

Webster defines ethics as the science of human duty, a duty incumbent upon all to respect the rights of others in their daily intercourse—to subordinate individual interests to the common good. This is essential to all advance in civilization and social evolution—and doubly true in advancing proficiency in our profession.

It is assumed in the professions that individual learning and social culture has its highest representatives and when one falls below the ethical standard, his degradation is strikingly apparent.

From our vantage ground, moral impulses to just acts should take us as far beyond the need of admonition of a written code of ethics as it does beyond the need of statutes against larceny and malicious trespass; these offenses having no parallel with the broken spirit of the unwritten code of ethics. I quote them for your comparison.

GRAND LARCENY.

Whoever feloniously steals, takes and carries, leads or drives away the personal goods of another, of the value of twenty-five dollars or upward, is guilty of grand larceny, and, upon conviction thereof, shall be imprisoned in the State prison not more than fourteen years nor less than one year, fined not exceeding double the value of the goods stolen, and disfranchised and rendered incapable of holding any office of trust or profit for any determined period.

PETIT LARCENY.

Whoever shall feloniously steal, takes and carries, lead or

drive away the personal goods of another of the value of any sum less than twenty five dollars, is guilty of petit larceny, and upon conviction thereof shall be imprisoned in the State prison not more than three years nor less than one year, fined in any sum not exceeding five hundred dollars, and disfranchised and rendered incapable of holding any office of trust or profit for any determined period, or he may be imprisoned in the county jail not more than one year, and be fined in any sum not exceeding five hundred dollars and disfranchised and rendered incapable of holding any office of trust or profit for any determined period.

Upon a second conviction of petit larceny, the person convicted shall suffer the punishment prescribed for those convicted of grand larceny.

MALICIOUS TRESPASS.

Whoever maliciously or mischievously injures or causes to be injured any property of another or any public property is guilty of a malicious trespass, and upon conviction thereof shall be fined not more than twofold value of the damage done, to which may be added imprisonment in the county jail for not more than twelve months.

The question is submitted. Is not the invasion of the advertising dentist into any community a greater offense than the committal of crimes here quoted, and made punishable by fines and imprisonment? The larceny of twenty-five dollars has no part in comparison with the wrong perpetrated by the class here held in view.

One who has become sufficiently degraded to commit the least of these offenses whereby imprisonment is a possible penalty, would be marked as unworthy of confidence in moral rectitude, likewise he who subordinates moral principle to base avaricious desires, as in the methods of the "advertising dentist," so weakens his better perceptions that moral turpitude stains his life, a fallen man, fallen below the ethical law of plain human duty. Where ethical law ends, common law begins. Is he who ignores the former safe in standing just beyond the grasp of the law for recognized wrong-doers, only on the border land of outlawry?

Benjamin Kidd declares that "one who brushes aside the restraints of moral principle is little more than a highwayman at heart."

Individual interests cannot progress to their best development without subordination to the best interest of humanity.

"As might well we argue that because the fruit survives for a time when removed from the tree, and even mellows and ripens, that it was therefore independent of the tree."

"Only by generating that great fund of altruistic feeling can all people be ultimately brought into the rivalry of life on conditions of equality."

Nothing short of a weakened moral perception can be attributed to those who parade their claims for superiority and cheap operations in the advertising press.

A newspaper advertisement of more than your name and location is superfluous.

Your sign and a standing professional card is all that can be of substantial aid; intelligent persons seeking the services of a dentist are more diligent than you may suppose in gaining information of your character and are not influenced in your favor by paid for and self-dictated compliments.

In your office alone you can make the reputation which is desirable and permanent.

Only here, by your good works you can spread your fame through well pleased patients, who will be glad to advertise and recommend you from their hearts.

Fees commensurate with the time and skill involved in your labor must be demanded. To ask less is sure to lower your standard of excellence.

Such has been the progress in the science of human duty and endeavor that a new era is rapidly drawing upon us. We are rapidly rising above the requirements of self-imposed restraints in a written law of ethics as we are above the State criminal code.

The unwritten law of ethics, the limits of which include the Golden Rule, is our only guide and security. When we recognize this we will be as far above any personal concern for the written code of ethics as we now are above the State criminal law, and will regard violations equally repugnant.

All, who are ordinarily observant, must recognize the fact that we are now living in what may be termed an awakening era. A greater force of thought as to how we can better live is coming to us. The best and purest minds of this age are making a searching analysis of the great questions of life—of time and eter-

nity—mortality and immortality. These scientists concur in the belief that we are nearing a pause in the material side of life—that art and invention which has made such marvelous strides in the last half of our century is now yielding, in harmony with a law of alternation, to the metaphysical or spiritual questions concerning man.

From a sense of duty I call your attention to this subject and ask that it may become a part of your inquiry and study. By so doing you will find an answer to many problems in life. You will find that earth should not be the battle ground for brother against brother to gain subsistence. This study can alone reveal to you the real ethical law, and make it a rule of faith and practice.

The essential and supreme gifts which make up a perfect man is given by Drummond as follows: "Patience, kindness, generosity, courtesy, unselfishness, guilelessness, sincerity, humanity, *good temper*."

When we consider that these attributes are essential to perfect manhood, how fragmentary must be our claims, still we must not despair as the first named is patience.

I pass to the last, and ask you as dentists to acquire it. A *good temper* cannot be overestimated. It is so easy to become exasperated when everything is not as we wish it to be. In our juvenile days anger was our first demand to stimulate us to a supposed proper resentment of all aggressions. Our associates encouraged and applauded it until it grew with our growth, and after we attained to the age of better judgment our philosophy is too often *unequal* to its subjugation.

Anger is our besetting sin—a relic of barbarism, purely animal.

A hot temper is the expression of an unenlightened selfishness which tolerates only "my way" and has no consideration for your way. "It is never justifiable in an intelligent person, it is an original sin attended in the past with all the cruelties of war's tortures and inquisitions—an inheritance from savagery and utterly inconsistent with civilization or intelligence."

Under its force reason yields.

Rage is momentary insanity.

It is a passion which intellectual cultivation should disown.

Humanity is defined as kindness and benevolence. The human tongue, when unrestrained by it, is an evil greater than alco-

holic intemperance, in pernicious gossip and generally disparaging remarks.

We can say in sixty seconds what many years of vain regret will fail to obliterate—inject a poison past all healing.

Drummond writes that “God has stowed away a vast amount of enjoyment in the deeds we never do, and the words we never say.”

The exactions of polite society impose what may be expressed as rules of propriety and is known as etiquette.

Etiquette as concerns us professionally in regard to our initiatory intercourse with our fellow practitioner is the reverse of general society's rule, in that the newcomer makes the first call upon the reputable resident dentists of the place in which he elects to locate, informing them of his intention of becoming a resident and expressing his desire to be in ethical relations, when courtesies due him follow.

I rejoice at the presence of women in our ranks; they will be a potent factor in this great reformation; with their intuition of right, keen preception and delicate impulses they are certain to become barriers to all degrading deviations and lead in that refinement for which we must all aim.

In conclusion, I can sincerely give you every encouragement as prospective dentists; there is room and reward for the expansion of every noble ambition. When you enter the dental mansion, bring to the household no disorder and by your aid we will enter upon the new century just dawning, fortified to lead the lives which infinite justice demands.

S. B. B.

DENTAL PATHOLOGY AND PRACTICE. By FRANK ABBOTT, M. D.
Pages 240, cloth, price, \$3. Philadelphia: The S. S. White
Dental Manufacturing Co. 1896.

We presume that the author has the intention of getting out a second edition very soon after the disposal of the first edition of this republication of his numerous papers on histology and pathology. If such is not the case, the chapters on treatment and filling of teeth, roots, and so forth, might have been rewritten with much profit to the reader.

It is not our purpose or desire to review the previously published essays (the bulk of the book being used for that purpose)

but to let a little light on the very extraordinary notes on practice. Beginning at page 90 "Children's Teeth and their Treatment" is a chapter of less than four pages which might do very well for a preliminary lecture to junior students in a dental college as an introduction to the subject of the treatment of children's teeth ; but as a treatise for practitioners we do not observe any very startling orthodox methods even, to say nothing of the lack of up-to-date work on this very interesting field of dental practice. In the chapter on "Filling Teeth," pages 102 to 114, we find a plea for the practical banishment of the rubber dam, in favor of cotton or linen strips or cloth to keep moisture out of the cavities !

No mention is made of tin or tin-gold in a manner to induce a novice to try it for the purpose of saving a tooth. Really in looking over this chapter, we find it too brief to be of value to a student or practitioner. As to the use of an automatic mallet, do our best operators use it? If so, we have failed to find it on their operating tables except as a curiosity or for simple cavities with hard solid walls surrounding them. Alkaline methods of treatment of sensitive dentine are of undoubted value, but there are others, more quickly used and better for the purpose in most cases. Chapter XI, "Exposed Pulp in Teeth and their Treatment," well, we think we will let it go, as no one will care to change his practice to conform to it. Chapter XII., "Treatment of Pulpless Teeth," is not in accord with present modes of practice in the West at least, and is not likely to be followed to the disadvantage of a client. The "Wet" method of filling roots is not to be commended, nor is it necessary to use a powerful counterirritant after every root filling on the shores of Lake Michigan. (Some people use gold wire, lead, paraffin, gutta-percha and even gold or tin to fill roots of teeth in Illinois). Chapter XIII., "Alveolar Abscess" all varieties are treated with zinc chloride, 10, 20, 40 and 60 grains to the ounce of water, and 1 to 10,000 bichloride in water as an irrigant. No pyrozone, no peroxide of hydrogen, no other drug. How does the author treat a "cold" abscess? We have many such in Chicago. (This chapter will need revision in the second edition). Chapter's XV. and XVI. are devoted to "Abscesses in the Salivary Glands" and "Salivary Calculus and Pyorrhœa Alveolaris." The methods of the author are unique, and his therapeutics very simple and concise. "Chapter XVII., "Facial Neuralgia." This chapter is largely borrowed from Harrison Allen, and Todd, and Bowman,

and the practice portion at the end of the description of the fifth pair of nerves and the function of the same is meager and unsatisfactory as a guide to the student or practitioner. Chapter XIX., "Conditions of Patients During which Severe Dental Operations should be Avoided," and Chapter XX., "Stomatitis, Varieties, Causes and Treatment" are short, and more or less orthodox. A new variety of stomatitis is described as "*Spontaneous Stomatitis*" whatever that may be. A little reading of Henoeh or Starr, on diseases of children might here be read with profit by the author. The book is well illustrated, printed and bound, and save for the paucity of the treatment, would be a serviceable work in the hands of a student, but as an authoritative exposition of our knowledge of the basis of practice, or of practice as we understand it, it is a complete failure. It is remarkable for what it does not contain. A systematic guide to practice (if the reader is willing to help get off the first edition), then the author will doubtless accept our suggestions and get out another in time for the fall opening of the schools. G. S.

LEHRBUCH DER CONSERVIRENDEN ZAHNHEILKUNDE. (Text-book of Conservative Dentistry). Von W. D. MILLER, Professor of the University of Berlin. Eight volumes, 416 pages, with 420 illustrations. Leipzig: Published by Georg Thieme. 1896. Price:

This work, from the pen of the well-known author, might be appropriately termed a text-book of American dentistry in the German language. It is confined strictly to what its title indicates, the conservation of the teeth. The author has freely drawn upon all available sources for information, especially, however, on the writings of Americans and Germans. The frequency with which authorities are cited illustrates the extensive preparation of this work by Dr. Miller, and it may be considered a proud distinction that it teems with illustrations and opinions of American dentists.

Concisely and briefly, the therapeutic defects of the dental tissues, and their treatment without the means of filling, is first presented; this is followed by an exhaustive consideration of the various materials and combinations of materials used for filling, the instruments, manner of using them, examination of the mouth, the exclusion of moisture from cavities, the means and materials employed for this purpose, the preparation of cavities, treatment of sensitive dentine, the principles involved in filling with various

materials, cohesive and noncohesive gold, plastics and porcelain, etc. This is followed by a classification of cavities, and the method of treatment of each class, the use of the matrix, the treatment of fractured and accidentally perforated teeth and roots, the finishing of fillings, the treatment of secondary caries, and this part of the work is finished by an elucidation of the rotation method of filling.

The second part of the work is devoted to a consideration of the diseases of the plastic tissues of the tooth, beginning with the treatment of the exposed but healthy pulp, followed by the diagnosis and treatment of the pulp when diseased. Hyperæmia, pulpitis, the causes leading thereto, the various stages of the condition, acute partial, acute septic, acute total, etc., chronic and hypertrophic, are all considered in the accepted light of the most modern experience. The destruction of the pulp, treatment of the necrotic pulp, and the filling of root canals receives due consideration. A chapter is devoted to the diseases and treatment of the peridental membrane, one to pyorrhœa alveolaris, odontalgia, cleaning and bleaching of teeth, prophylactic treatment and the care of the deciduous teeth.

The author has clearly kept in view at every stage of the work simply the conservation of the tooth, and has presented the subject in an admirable manner. It is almost impossible to take issue with him, in any of the statements presented; for practices which are obsolete (the Arthur method, for instance), are disapproved or condemned by him, while on the other hand, he presents no new and untried methods, but merely places the stamp of approval upon well-known and accepted methods of conservation. The work is certainly a valuable addition to the German literature of dentistry, and will no doubt prove acceptable to the profession of that country. The paper and typographical execution leave nothing to desire; the binding is of that flexible character so common to the books published in Germany. The illustrations, in the main, are admirably executed, yet it is no difficult task (excepting the photograms), to recognize those made in America or copied from American literature.

L. O.

HARRIS' PRINCIPLES AND PRACTICE OF DENTISTRY. Edited by F. J. S. GORGAS. Thirteenth edition. 1250 Illustrations. Price, cloth \$6. Philadelphia: P. Blakiston, Son & Co. 1896.

All dental students and many practitioners will concur in the

opinion that the last edition of this standard work is best of all, now to be found in the English language for general use as a guide to practice and as a work of reference.

In looking over the thousand or more pages we find little to criticise and much to commend. The editor has done his work with much care and there are only a few minor errors to be noted. If any portion of the work may be said to be incomplete, we would think that the parts devoted to pathology and therapeutics would fall into this category. A little greater care might have been given with profit to the reader in the elaboration of the above subjects.

In the portion devoted to orthodontia and crown and bridge work a few parts might be strengthened by adding a little more to the detail in the management of cases. Altogether, we are of the opinion that this last edition will serve as a guide and companion to the numerous English speaking students throughout the civilized world.

PAMPHLETS RECEIVED.

PATHOLOGIE DES DENTS ET DE LA BOUCHE. Par le Dr. Leon Frey, Paris. J. B. Baillière et Fils. 1896.

PRACTICAL NOTES.

POTPOURRI.

BY T. W. PRICHETT, WHITEHALL, ILL.

Our text shall be, "The longer we live the more we find out."

I have found out that it will not do to fool with the chairman of the executive committee of a dental society, for like some voracious monster, his appetite is never satisfied. Ogre-like he sits up nights, for a long while before the meeting, contriving schemes and plots to beguile the innocent and unwary, in order to make easy prey of them. Like monsters in general, he allows nothing to stand in the way of the accomplishment of his desires.

Truth, conscience, manhood and most of the commendable virtues he will sacrifice, for the time being, to the one object of his ambition—a good meeting.

While the Mephistophelian charm is upon him, there is no crime mentioned in the statutes he would hesitate to commit,

rather than be foiled in his undertaking. Forging with him is a pastime and a pleasure, and if you mention it to him as a crime, he will laugh you to scorn.

Shall the man be blamed for these temporary exhibitions of a disordered mind? Let any ex-chairman cast the first stone.

If the meeting is a good one, we will forgive the criminal, and turn him loose with our blessing.

“The longer I live the more I find out” that *amalgam*, when well inserted into the cavities of teeth, will usually prevent extension of decay, for periods of from three to fifteen years. Gold cannot be made a universal material for filling the teeth, if duration and comfort are made the criterion of success. If this proposition be admitted, then let us more cheerfully take into our partnership, the next best thing, (in many cases the better thing), *amalgam*, and by careful study and practice, make it minister successfully to the necessities of our struggle with dental caries.

Let us keep our eyes on that Promethean workman at Jacksonville and note the evidences of his heating and forging, hammering and pounding, testing and trying, straining and stressing of the various substances that constitute our means of offense and defense, in the fight we make for the preservation of the teeth of our patients.

When we shall have had time to verify and appropriate the most salient items of his laborious experiments and findings, then let us apply our newly acquired knowledge, with renewed zeal to our everyday work—making the work of to-day better than yesterday, and the work of the morrow better than that of to-day.

If our anchorage lines have been too weak, make them stronger. If we have not extended our cavity margins sufficiently, let us extend them more. If we have not beveled our enamel margins enough, give them more bevel. If we have not contoured our fillings as they should be, let us contour them more.

If we make an amalgam filling in a large cavity in the occluso-proximal surfaces of a bicuspid or molar, let us make it beautiful and artistic—if the patient will let us.

If we have to fill such a cavity with gold, let us do so the very best we can—and pray for the result. If we have not filled the incisor teeth of some children with amalgam heretofore, we had better begin now. If we have not used the Perry separator or some equivalent, for immediate separation, let us begin now. If we have

not used rolled sheet copper (up to forty gauge), for matrices and secured in place with warmed Gilbert's stopping pressed into the interdental space and upon the teeth, rubber dam, clamp or separator, better begin at once.

If we have not used strips half an inch wide and six inches long of the finest quality of mull for finishing the proximal surfaces of amalgam fillings, then let us try it right away.

If we have not been in the habit of requiring two sittings, different days, for the filling of two proximating cavities in bicuspid or molars with amalgam, where a nice adjustment of contour and contact is desirable (and it nearly always is), then let us at once begin to cultivate the habit. The day is upon us when our discriminating patients want and demand of us work of the most permanent and comfort giving quality. To do this requires the broadest eclecticism of practice, if we reach the highest standard of success. To do this well, a man must keep a sharp eye on his own failures from year to year, and as fast as discovered eliminate all possible causes leading to such results. He must note carefully the failures of others, and not follow their footsteps into similar error. He should study carefully the literature of operative technics of the last five years, and with a good eye, a dexterous hand, an honest intention, and an observant head—how in the name of all the gods can the dear boy fail to make an enviable record for himself—as “time tangles the remnants of his once beauteous auburn hair.”

ARRANGEMENT OF ARTIFICIAL TEETH.*

BY DR. A. O. HUNT, IOWA CITY, IOWA.

The subject of this paper was suggested to me by a member of this society who has been long in practice and obtains excellent results in dental operations. Yet he seemed to think that it was a matter not properly understood by members of the profession.

There is little opportunity for a disagreement in regard to this fact. One has only to observe the various sets of artificial dentures worn, to know that it is only in exceptional case that there is any improvement in the facial contour or expressions when the individual is compelled to wear them.

There is no general improvement in this state of affairs over like conditions such as have existed for years.

* Read before the Iowa Society.

We cannot, however, say there has been no improvement in the number of types, variety of color, size and form in artificial teeth.

With good judgment and a clear understanding of what is needed, artificial teeth may be selected from the stocks of the manufacturers to meet any case, whether of ordinary or extraordinary character.

Probably no one at the present time would undertake to carve a set of teeth for an individual case. It would require too much time and when finished would be in no wise equal to those made in molds.

We have little to justly demand of the manufacturers of artificial teeth. They have already advanced beyond the capacity of the profession at large to use their best products.

A denture may be correct mechanically; have sufficiently good articulation to masticate well; it may be useful and yet it is not what it should be. Numbers of years of practice have not produced any better results than this.

We cannot believe that one could reproduce the human form in clay or marble if they only possessed the knowledge necessary to manipulate the materials and tools with which they work.

No more could a correct portrait be put upon the canvas if the amount of knowledge in accomplishing this was limited to the mixing of colors and the sketching of outlines.

There is an individuality that belongs to each specimen of the genus homo. No one is like another only in those general characteristics by which they are scientifically classified. "Variation and not constancy is the law."

Our literature is very complete as to those fundamental principles embodied in the consideration of the relation of art and artistic methods in the construction of dentures. A reference to some will be all sufficient for those who are interested to peruse them.

American System of Dentistry, *Dental Cosmos*, the various students' text-books, and I hope soon to have published the paper read by myself before this society in 1889, which gives in detail the changes and variations of expression that are controlled entirely by the position of the teeth in their relation to the lower fourth of the face. I then demonstrated what was the normal position of the cuspids. The length of the lower teeth and the position of the cutting edges of the superior incisor teeth. All of those positions

are important; in fact necessary, as they are the foundation upon which to proceed in the arrangement of a set of artificial teeth.

We will now consider some characteristics which if well understood will correct the formality with which artificial teeth are usually arranged.

Each natural tooth has upon its labial or buccal surface, a contour outline that is typical of all. It will be seen upon critical examination that these surfaces present three distinct arches, varying in relation to each other according as the temperament of the individual varies. These arches are located as follows:

At the cutting or occluding margin.

At the middle or largest diameter.

At the gingival margin.

The first or occluding margin arch is of the shape of a parabola; either correct as to this form or varying from it in the region of the cuspids in making somewhat of an angle while keeping the general curve form, and as it extends backward the line is nearly straight. The arch at the middle division of the teeth is more flat between the cuspid and the angle in the cuspid region is more pronounced with less of a curve and more of an angle; and as it extends backward the line is slightly curved.

The gingival arch is larger than either of the others; more flat in the anterior portion; curve more prominent at cuspid and the line backward describing somewhat of a circle as it proceeds backward.

To show this more clearly I have prepared some models with the teeth cut transversely at the points mentioned as locating the arches.

(a) The occluding margin arch.

(b) The middle arch.

(c) The gingival arch.

I also exhibit two sets of perfect models of which the others are counterparts. These were taken from mouths of persons whom you would say had a perfect set of teeth so far as the arrangement and articulation are concerned. Some irregularity is noticeable in each set, and because artificial dentures lack these slight variations from what some chose to call the *ideal* they are at once recognized as artificial teeth. And also because the arches mentioned have not been noticed in the setting of artificial teeth which are so close an imitation of the forms of natural teeth, that the correct arrangement may be secured.

I have endeavored to arrange a full denture for the purpose of showing on one side what I deem to be a reproduction of the natural condition and on the other the usual faulty arrangement.

The photographs, plates are intended to show the arches, and the section of models made from the natural teeth.

For some time I have been observing the changes that occur in the jaws after the loss of teeth. One of these changes is, that as a rule the buccal teeth, if set directly over the ridge as it appears at this time, the teeth will as a rule be too far within the arch. The change is much less on the palatal and lingual side than on the buccal. The prominent portion of the ridge after absorption seems to be located at the inner margin of the alveoli except in cases where these crypts have been filled with new bone tissue, instead of the alveolar process being absorbed.

A correct imitation of the arrangement of the natural teeth cannot always be obtained, if the plan of setting the artificial teeth directly over the ridge as it appears is followed. Nor can the best results be secured either in appearance or for the purpose of mastication ; nor for the full use of the tongue and adjacent muscles.

I know this is contrary to all accepted doctrine, but a little experience in regard to it will satisfy most any one that the statement is correct. The line of occlusion is a typical one in every arrangement of the natural teeth ; namely, a line extending upward as it goes backward from the anterior occluding margin of the central incisors of the upper teeth ; and the same general direction back of the cuspids for the lower teeth ; the anterior lower teeth underbiting the upper ones with radical variation.

It is very rarely that this arrangement is reproduced in the artificial arrangement ; nor can it be reproduced in but few cases unless the teeth are set outside of the ridge which corresponds to the position the natural teeth occupied. When this is not done the scope of the lateral motion of the jaws is diminished.

A careful examination of the two sets of models of the natural teeth will more clearly illustrate my meaning. Notice also the relation of the antagonizing teeth to each other ; the inclination of the teeth themselves both laterally and posteriorly ; the manner in which the outer and inner cusps are adjusted ; also the level (so to speak) of the masticating surfaces in regard to the long outer cusps of the superior teeth and the long inner cusps of the inferior teeth.

These observations will also show where the prominent part of the ridge will be situated when the teeth are gone.

One cannot properly set up artificial teeth until all the peculiarities of the natural teeth are familiarized and where the variations are most likely to occur. This information can only be secured by the careful study of *models* made from the *natural* teeth and the mouth.

I think the most that is known by the profession in regard to this subject is what has been learned by one operator following another in obtaining the best conditions they could without a study of the conditions that exist in the mouth when the teeth are for the most part in their places. The attention is then engaged with the saving of the natural teeth and no observations are made that would assist one's judgment in restoring normal conditions when the patients present themselves without any teeth.

If this paper does not excite your interest in this kind of study, there will no good come of it, because there is no set rule which, when well followed will be a guide for the arrangement of a set of teeth. Each set *must* have its individuality, and it does not so much require that one shall be an artist or have artistic instincts, as that one should know the natural conditions as they exist.

DENTAL COLLEGE COMMENCEMENTS.

MISSOURI DENTAL COLLEGE.

Dental Department of Washington University. Thirty-first Annual Commencement of the Missouri Dental College, St. Louis, Saturday, April 25, 1896. Graduates: Harry King Barnett, Illinois; William Bruce Bagbe, Missouri; Edgar Herbert Bragg, Missouri; Peter Thomas Cunningham, Missouri; Alfred Darst Fuller, Missouri; Max Fendler, Missouri; Harry Moll Fisher, Ohio; James Fraer Gwinner, California; Charles Joseph Garcia, Missouri; William Eugene Heatherly, Missouri; Charles Ernst Edward Hesemann, Illinois; Eugene Jordan Hume, Missouri; Henry LeGrand Jones, Missouri; Henry Frank William Koch, Missouri; George Hart Owen, Missouri; Alonzo William Rue, Illinois; Edward Guernsey Simmons, Missouri; Elmore Hiram Smith, Missouri; John Mead Sloan, Missouri; Nathaniel Benjamin Stanza, Missouri; William Morris Tuttle, Missouri; Walter Edgar Urban, Missouri; Stephen Huff Voyles, Indiana; August Joseph Waldschmidt, Germany; Charles Henry Wharton, Iowa; William Simpson Wallace, Illinois; Robert Daniel Woelk, Illinois; Florian John Wioser, Illinois.

MEMORANDA.

Have you used "solila" gold?

Dr. S. B. Brown, of Fort Wayne, was in Chicago in April.

Dr. Gordon White, of Nashville, Tennessee, was a recent visitor to Chicago.

Dr. Grant Molyneaux, of Cincinnati, spent a few days in Chicago during April.

What do you use to bleach a tooth stained with a copper point or copper amalgam?

R. S. Williams is deceased. Who will make the incomparable cylinders now that he is gone.

Paraffine may be used to fill a perforated root; one that has been perforated by your own little drill, engine or otherwise.

The Southern Dental Association will meet at Lookout Mountain July 28, in place of meeting in Nashville in November, as was first intended.

The Odontological Society, of New York, recently named their monthly clinic "The Dwinelle Clinic," in honor of the late Dr. Dwinelle, one of the earliest members.

At Excelsior Springs, Mo., the States of Iowa, Nebraska, Missouri and Kansas will hold a joint meeting beginning about the 23d of next June. A full programme is out showing what will be done.

Everything now is cataphoretic. It is rather painful to the beholder, however, to wait, and wait ten or twenty minutes and then find that something has interfered to prevent its action, a gold filling for instance, or some other plug or stopping.

The faculty of the Ohio College gave a dinner at the University Club on the evening of April 16, to Drs. J. Taft, W. V-B. Ames, C. M. Wright, Grant Molyneaux, C. I. Keely, L. E. Custer, J. E. Cravens, H. T. Smith, A. W. Harlan, J. I. Taylor, J. S. Cassidy, H. A. Smith and others. It was a very enjoyable affair and the speeches were excellent and to the point.

STATE BOARD OF COLORADO.

The Colorado State Board of Dental Examiners will hold their next meeting June 9, 10 and 11, at the office of W. E. Griswold, 401 Mack Block, Denver, Colorado. All applicants should address Dr. D. Murray, Secretary, 421 Mack Block, Denver, Colorado.

Following are the officers of the Mississippi Valley Dental Association:

President, Dr. J. E. Cravens, Indianapolis, Ind.; First Vice President, Dr. G. Molyneaux, Cincinnati, Ohio; Second Vice President, Dr. H. C. Matlack, Cincinnati, Ohio; Corresponding Secretary, Dr. W. S. Locke, Cincinnati, Ohio; Recording Secretary, Dr. H. T. Smith, Cincinnati, Ohio; Treasurer, Dr. F. A. Hunter, Cincinnati, Ohio. Executive Committee: Dr. J. R. Callahan, Cincinnati; Dr. L. E. Custer, Dayton, and Dr. M. H. Fletcher, Cincinnati.

WAR DEPARTMENT,
SURGEON GENERAL'S OFFICE,
U. S. ARMY MEDICAL MUSEUM AND LIBRARY,
Corner 7th and B. Streets, S. W.

WASHINGTON, D. C., December 10, 1894.

DR. WILLIAMS DONNALLY,

1022 Fourteenth Street, N. W., Washington, D. C.

Dear Sir :—Your letter of December 10 is received. The Army Medical Museum and Library are collections which attempt to cover the whole field of medicine, including dentistry.

The library contains a large collection of books, journals and pamphlets relating to dentistry, and an attempt is made to secure all the new publications of value in this branch in all languages. The Museum contains between 400 and 500 specimens of casts of abnormities and deformities of the jaws and teeth, but it should have at least ten times as many to properly illustrate this subject, and there should also be an extensive series illustrating the effects of various forms of treatment.

The collections are contained in a fireproof building, which is of ample size to permit of their expansion, and it is certain that everything contributed in the way of library or specimens will be properly preserved and exhibited, and duly credited to the donors. The collections are intended for public use and study, and are available for the researches of any one who chooses to come to the building for this purpose.

I have attempted in past years, to call the attention of the dental profession to this institution as one which they should endeavor to make complete in all matters relating to the pathology and treatment of diseases of the teeth and jaws, so that it might be considered by them as their national collection of literature, specimens, apparatus, etc., to illustrate the history and conditions of dentistry, just as other sections of the museum and library are considered to be their national collections by the physicians, surgeons, and specialists of the country, and it appears to me that more definite, useful, and permanent results can thus be obtained than are likely to follow from an attempt to create a new museum and library devoted exclusively to matters of interest to the dental profession.

Very respectfully,

JOHN S. BILLINGS,
Dept. Surg. Genl., U. S. Army,
Librarian, S. G. O.

WAR DEPARTMENT,
SURGEON GENERAL'S OFFICE,
U. S. ARMY MEDICAL MUSEUM AND LIBRARY,
Corner 7th and B Streets, S. W.

WASHINGTON, D. C., September, 20, 1895.

DR. WILLIAMS DONNALLY,

1022 Fourteenth Street, N. W., Washington, D. C.

Dear Sir :—I have the honor to acknowledge the receipt of your communication of September 16, inviting attention to the action of the American Dental Association in relation to the Army Medical Museum, as reported in the *Dental Cosmos*, and in reply will say that we shall be most happy to coöperate with your

committee with a view to the formation of a collection thoroughly illustrative of all matters pertaining to the subject of dentistry.

Our museum already contains quite an extensive list of casts of maxillæ illustrating physiological and pathological dentition, presented by Dr. Samuel Sexton, of New York City; also a number of miscellaneous specimens, casts, etc., from various sources, as well as quite a complete anatomical exhibit of the normal development of the teeth.

With regard to the contributions considered desirable, I would suggest casts, photographs and specimens of anomalous dentition; diseases of the maxillæ and oral cavity; photographs or casts of surgical operations, showing, if possible, the condition of parts before and after operations; photographs of prothetic apparatus, and all miscellaneous exhibits which may lend an interest to the subject of dentistry. All specimens, casts, etc., should be accurately labeled, and a concise description or history given when possible.

In any matter of detail on this subject we shall be ready at any time to give you advice or suggestion.

Very respectfully,

D. L. HUNTINGTON,

Dept. Surg. Genl., U. S. Army,

In Charge of Army Medical Museum and Library.

Dear Doctor:—The Thirty-Sixth Annual Meeting of the American Dental Association formally recognized the Army Medical Museum and Library as the National Museum and Library of the dental profession of the United States, and appointed the undersigned a committee to coöperate with the officer in charge of this institution "in enriching its stores of dental literature and museum specimens."

It is quite unnecessary for this committee to enlarge upon the value, to the dental profession and the general public, of a national collection which would at all times illustrate the past history and present condition of the science and art of dentistry. It should be amply sufficient, in order to arouse the active interest and elicit the hearty support of every member of the dental profession, to call attention to the fact that the United States Government has established and will permanently maintain such a collection at the National Capitol, in connection with similar collections covering every branch of medicine and surgery. At first this institution was limited to military medical subjects, but later greatly broadened its scope until now it is practically a medical department of the government, perpetuated under a settled policy, maintained by congressional appropriations, housed in a large building erected for the purpose, extended to cover the whole field of medicine, and opened to the public—the intellectual property of all professions and classes, the recognized national collections of the medical profession.

It is visited by over 50,000 persons, and consulted by over 3,000 students, annually.

The Museum contains about 35,000 specimens of which over 12,000 are pathologic.

The Army Medical Library is admittedly, throughout the world, the largest and most complete of its kind in existence. It contains three-fourths of the medical literature of the world and nine-tenths of the medical literature of the past ten

years. There is a constant daily addition to its 120,000 bound volumes, 190,000 pamphlets and 1,200 current periodicals. Its literature is not only greater in volume than the medical literature of either the Library of the British Museum or the National Library of France, but covers a wider field and forms a better practical reference and working collection. Its value is greatly enhanced by an unequalled index-catalogue of 18,000 pages.

The dental section of this library contains a large and choice collection of the recent literature in English and other languages relating to dentistry, and our efforts should be to make this section complete, especially with regard to the rarer publications which disclose the conditions from which modern dentistry developed and reveal the history of the operation of the forces and factors concerned in the evolution of a distinct profession. While most of the current literature is bought, the contributions of publishers and authors would permit the money available for the purchase of their works to be used in other directions equally as essential to the purposes of the institution.

The Army Medical Museum contains but the nucleus of a collection of specimens relating to dentistry, which is as unfortunate as it is strange, since so much of dentistry can be illustrated by models, drawings, photographs, etc. It cannot be said that the dental profession is lacking in zeal for its advancement, but it must be confessed that it has too long failed to utilize this opportunity to accumulate, preserve and exhibit, at Government expense, the evidence of its progress and attainments. Many thousands form their estimates of the value of the attainments of the various branches of medicine and surgery by comparing here their exhibited specimens. For this reason, as well as for the educational advancement of the dental profession, we should make this collection the greatest object lesson in the world.

This institution could easily be made of great advantage to the dental colleges as a "clearing house" for the exchange of duplicate literature, and of objects, drawings, casts, etc., used in teaching. It would not be an extension of its purposes to illustrate here the methods, apparatus and appliances used in college training.

Without attempting to detail the kind of specimens needed, it is safe to say that anything illustrative of any part of the subject of dentistry, or which would, in connection with other specimens, throw light on the etiology, pathology or treatment of the diseases and deformities of the teeth, jaws etc., would attain a greatly enhanced value by being placed here as parts of a complete collection.

Every specimen contributed should bear the correct label, a concise history, the name of the contributor, and addressed, prepaid, to the Army Medical Museum and Library, Washington.

Never was there opportunity freely offered a profession to demonstrate its value, to acquire a higher rank among the learned callings, to acquaint the professions and the general public with its achievements and to secure the preservation and exhibition of all things pertaining to it of present or future historical and educational value.

We appeal to the dental societies and to individual members of the profession to regard this interest as one of transcendent importance, and, leaving it not solely to the hands of medical men, to so promote it that the hand and mind of

the profession may be seen in the result of the efforts to make the dental section completely illustrate all matters within the broadened scope of dentistry.

We invite correspondence and will otherwise, in any way possible, serve you in furthering the object for which the American Dental Association appointed us.

WM. DONNALLY, Washinton, D. C.

J. TAFT, Cincinnati, O.

L. D. SHEPARD, Boston, Mass.

H. J. M'KELLOPS, St. Louis, Mo.

HENRY W. MORGAN, Nashville, Tenn.

Committee.

OBITUARY.

DEATH OF DR. P. G. C. HUNT.

Indianapolis lost one of her most prominent citizens and the profession of dentistry in Indiana its foremost exponent yesterday morning, when death claimed Dr. Phineas G. C. Hunt. He had been ill for over a month, and, although it was known that there were elements of seriousness about his condition, his death came as a surprise and a shock to his friends. He died at the home of his daughter, Mrs. Edward D. Kingsbury, at 654 College Ave.

Dr. Hunt was sixty-eight years old. He remained in active practice until this winter, when he took a trip to Florida, where he owns several orange groves. He was a sick man when he returned and his condition never improved. He was born in Champaign county, Ohio, in 1827. In 1833, his mother who was then a widow, moved with her children to Wayne county, Indiana, where her son attended the "district" school in the winter and in the summer applied himself to the labors of the farm. His elder brother, Dr. David P. Hunt, was at that time practicing dentistry in Indianapolis, and when the lad began to consider the question of a profession in life he naturally concluded to take up the same line.

He entered his brother's office as a student, and a few years later, when the latter died, he found himself in the possession of a large practice. He was not long in climbing to the top round in his profession. He possessed an almost inexhaustible store of knowledge bearing upon his profession, and he early began the practice of contributing to dental journals. He invented many devices of value to his profession, and he was one of the first to prove that teeth can be extracted and afterward replaced in the jaw without impairing their usefulness.

He was an enthusiastic experimentalist and in order to exemplify this theory he one day in the '70s called a number of his friends to his home where the first thing he did was to direct them to the poultry yard. Having attracted their curiosity, he had a drove of half a dozen roosters turned loose, each one of which had human teeth growing in its crest. He considered this a complete exemplification of his doctrine. In 1870 he was made a doctor of dental surgery by the Ohio College of Dental Surgery, the Indiana Medical College having honored him with the M. D. title the year previous. During the war he was president of the State Dental Association, and ever since the enactment of the law creating the board of dental examiners he had acted as president. His wife, whose maiden

name was Hannah Mary Phipps, died in February, 1892. The deceased was a thirty-third degree mason and was very prominent in the order. He leaves four children, Mrs. H. A. Crossland, Miss Luella Hunt, Dr. G. E. Hunt and Mrs. Edward Kingsbury, all living in this city.

A meeting of local dentists was held at the office of Dr. T. S. Hacker yesterday afternoon to take some action with reference to the death of Dr. Hunt, who was the oldest practicing dentist in this city. There were present the following: T. S. Hacker, Merit Wells, Alex Jameson, William S. Rawls, E. E. Reese, Elmer Smythe, A. J. Morris, Willard Gates, Dr. George, Robert T. Oliver, D. H. Oliver, David B. House, J. B. Morrison, Frank A. Hamilton, J. Q. Byran, Maurice Raschig and J. E. Cravens.

The following preamble and resolutions were adopted:

WHEREAS the death of Dr. P. G. C. Hunt of this city has removed from the ranks of active dentists one of its foremost and most honored members, therefore, be it

Resolved, That in the death of Dr. Hunt the dental profession of this city and State has sustained irreparable loss. Dr. Hunt in the highest sense represented the spirit of progress in his chosen profession. His death takes from us the best representative of the self-made practitioner. Dr. Hunt early made his influence felt in the national councils of dentistry, and his ideas are to be found embalmed in the books of to-day in the schools of dentistry. The history of American dentistry cannot be written without contributing to his praise.

Resolved, That a copy of these resolutions and note of this meeting be transmitted to the bereaved family of Dr. P. G. C. Hunt, and that the daily papers be requested to publish the same.

A beautiful floral tribute was ordered to be placed upon the casket. It will contain the inscription, "From the Dentists of Indianapolis." It was decided to attend the funeral in a body and to extend invitations to all dentists of the city and vicinity to join them.—*Indianapolis Sentinel*, April 25, 1896.

THE DENTAL REVIEW.

VOL. X.

CHICAGO, JUNE 15, 1896.

No. 6

PRESIDENT'S ANNUAL ADDRESS.

BY W. A. STEVENS, M. D., CHICAGO, ILL.

Members of the Illinois State Dental Society: With gratitude in our hearts to our Heavenly Father, we meet to-day in the capital city of this State for the purpose of holding our annual gathering. Our meeting together seems like coming home ; and it is with that feeling of attachment due to this Association I greet you all to this our Thirty-second Annual Session. It seems but a day since we were gathered together in the city of Galesburg ; and the recollections of our labors are green in our memories, and the surprise you gave me by electing me to the presidency is not forgotten.

This annual session reminds us that another year is gone to be numbered with the past, and brings us so much nearer to the goal of our existence ; let us rejoice in the present ; let us be thoughtful with regard to the future and ever bear in mind that life is short, and in it there is much to do, and we must press onward to the performance of the duties that belong to us, and leave behind no uncanceled obligations for the advancement of our chosen profession, for the benefit of those who come after us, and especially those who seek relief from our hands.

One member of this society has passed within the vale since our last session, Dr. E. B. Call, of Peoria. And another, though not a member of this society, whose familiar face and voice will not be seen or heard by us again on this side of the vale that separates the mortal from the immortal, one who had as much interest in this society and its prosperity as if he were a member of it, in whose place of business it was organized thirty-two years ago, who

was the first to suggest to the house of Jones, White & McCurdy, the advisability of establishing a branch house for dental supplies in what was then thought, by many in the east, to be the "wild west" and in the city of Chicago, where they imagined the wild buffalo and untamed Indian still followed their paths and trails through its streets, sustained in his opinions by only one member of that firm, S. S. White, he came west and established a branch house for dental supplies, which largely through his energy, zeal and integrity, has grown to be second (only to its parent) in the world—S. R. Bingham, who on the first day of February, 1896, stepped into the country from "whose bourne no traveler returns," whose life of integrity is worthy of imitation. His hope for a bright life beyond this mortal existence was so strong, I believe he would have preferred that the last respects paid to his memory should have been as far as possible removed from the funereal. The blinds open, the curtains raised that the sunlight of heaven might fill the room, the flowers he loved so well scattered in profusion around him, the music as far from the dirge as possible, and a crown of roses hung at the door in place of the emblem of grief, his strong belief in changing from mortal to immortal existence was the end of sorrow, suffering and grief. He would have preferred songs of joy and exaltation.

The subject of education before entering upon the study of dentistry was ably presented to you ten years ago by Dr. Gilmer in his address to this association, but I wish to present a few statistics for your consideration, as to the present educational standard, as compared with other professional callings. Reports from twenty-nine institutions of learning showed out of 1,473 theological students 985 were college graduates; out of 2,659 law students 968 had completed a four years' college course; of 3,110 medical students, 990 had taken the regular literary course, giving us .668 per cent of theological students who had graduated in science and art; .364 per cent of law students and .239 per cent of medical students, who took a similar preparatory training. I have written to twenty deans and secretaries of dental schools, making inquiry as to how many of their students were grammar, high school, academic or college graduates. To my inquiries I have received replies from eleven, only seven giving any statistics, only one who rejected any, (namely thirteen) as unqualified. These seven give us a total of matriculants, 1,859, graduates in literary colleges 118,

some in veterinary colleges; of high school and academy 618; and of the common school education, which usually consists of the three Rs., 926, making .063 per cent in advanced education, .332 per cent in high school and academy, .498 per cent in common school or less in education.

According to the United States census report for 1890, there were in the United States 17,498 dentists, of whom 337 were females, which would give us about 8,749 who had only completed the three R's. The statistics of the Bureau of Education of the United States for 1894 and 1895 (not yet in print) show there are 45 dental schools in the United States, with 968 instructors for 5,347 students and 1,297 graduates. According to this it took one professor to graduate 1.343 per cent of a student, not taking into account the special and assistant professors. In the report of the Bureau of Education of the United States of 1892 and '93, there were 29 colleges, having 316 regular and 195 special professors, making a total of 511 professors to graduate 427 students, or one professor to graduate .083 per cent of a student. Of these 29 dental schools one graduated 1 student with 11 teachers, and one graduated 128 with a corps of 52 instructors. These are the two extremes of the ending of the year 1893. The dental schools of Chicago at the close of the year 1896 had more than 1,000 students. They stamped "graduated" on over 300, and many of them could reply to examination questions similar to those reported by Dr. Brown, of New Jersey. The applicant for graduation replied to the question, "What is shock?" A. "Shock is the sudden checking of the nerves caused by accident." Again, "What is the difference between a narcotic and hypnotic?" A. "Narcotic acts on part the small intestines, hypnotic acts on the whole large intestines." Which is only excelled by the medical student when asked, "Of what cause, specifically, did the people die who lost their lives at the destruction of Herculaneum and Pompeii?" replied, "They died of an eruption, sir." Dental colleges—Heaven save the mark of most of them—are turning out barbers, apprentices and dry goods clerks by the hundreds, sending them out freshly branded as D. D. S., to prey upon the public. He who would acquire a clear insight into the principles of dentistry must have either a fair education or a development of a perceptive faculty akin to genius. To assume that a man of merely ordinary ability and education can pass from an apprentice of a trade to the

profession of dentistry by a three year dental college course is to suppose an impossibility. Many of our dental colleges do not ask or seek to know the mental qualifications of those applying for admission in their institutions. The great and main object is the qualifications to pay his \$100 annual tuition fee and the other incidental expenses connected with the college. This being the case, and as many men are no more honest than the law compels them to be, When ! Oh !! When !!! shall we have a law that not only regulates the practice of dentistry, but also the dental college? The great need of a national law controlling these institutions, and a board in every State, of the profession, before whom every one who wishes to practice dentistry should appear for examination to prove he or she is qualified before being permitted to enter upon such duties, no matter what college he may hold a certificate of graduation from, as most of them are conducted on a commercial basis, not to make men qualified for the duties of the profession, but how many dollars they can make for the stockholders.

It is a great injustice to any board of examiners to be compelled to say which are reputable and which are not. Because a person holds a certificate of having passed a three years' course in some dental school does not guarantee that he is qualified to enter upon dental professional duties. Dr. Koch in his paper last year on "Illinois Statutes of 1881," in discussing his college orchard says, "The board is only permitted" (I would say compelled because the college has established a three years' course, and belongs to the National Association of Dental Faculties), "to say this fruit grew upon a good tree, therefore it is wholesome, delicious, beautiful, pure and in every way fit for the market." Manitoba's legislators have looked after the welfare of the people, though among the younger governments, enacted a law requiring every one to take an examination before examiners. Why should Illinois legislators be behind Manitoba or little Saxony where no one is permitted to shoe a horse unless he has passed a public examination and is properly qualified, a provision that saves money for farmers and others owning horses? Can it be possible that the law making representatives of this State think their constituents are of less value than Saxony of its equines? Bishop Vincent said in relation to the clergy, "God does not so much call men to preach as he calls them to prepare to preach," so the wants of the public are not so great for dentists as for those who desire to enter it, should prepare for it.

Illinois is the happy possessor of many treasures. In her bosom she carries a mine of wealth. The annual growth of her cereals are of more value than the whole output of the silver mines in the United States.* She is a world by herself, and stands in many things the first in the galaxy of stars that compose the Federal Union. It was her troops who were first to carry our National banner through the gates of the Montezumas in 1847. Men from Illinois have lead the Nation through its most perilous periods. It was an Illinoisan who won the first and last battle in the late international disturbance, which cemented the diamond starry banner into one glorious union of "one among many," which represents the essence of liberty, free thought and advancement in all branches of education. The one distinction Illinois should be proud of is to have been the home of a Grant, a Logan, a Douglas, and the immortal, incomparable, honest father, Abraham Lincoln. In our profession she is among the first; her State Dental Society ranks first; her dentists contributed the greatest amount of financial support to the last and greatest dental congress, in 1893. But the State Dental Society was unknown in it, save through its treasurer's report, and it is an Illinoisan who so far has carried forward and executed the will of the Dental Protective Association, and saved to the dental profession in the United States an average of \$100 each from *unjust* and *illegal taxation*, saving to the members of our profession of this Nation the sum of \$1,749,800 annually and to its practitioners in this State \$170,000 each year. Every one who is not within its fold should hasten to get there for his own protection, and bear his share of the burdens. According to the census report of 1890 there were 17,498 dentists in the United States. There are to-day 1,700 in Illinois, all protected by 2,931 members of the Dental Protective Association, and the energy of a few in a just cause. There has been obtained patents on almost everything appertaining to our profession, from treating and extracting an infant's tooth to the fastening of a clasp to a plate for one in old age. Contrast the smallness of these things with the latest discovery of the age, which was freely given to the world in a day for the benefit of mankind by Roentgen.

Let us have faith that *right* makes might, and in that faith let us to the end do our duty as we understand it.

*United States coining value of 1889, \$66,396,938; cereal value of 1890 \$1,376,038,615; corn alone of 1889 about \$59,515,341.36.

REPORT OF THE COMMITTEE ON DENTAL SCIENCE AND LITERATURE.*

BY A. W. HARLAN, M. D., D. D. S., CHAIRMAN, CHICAGO, ILL.

In presenting the annual report for the year of 1895-6, we find that one of the distinct additions to science is the work of Dr. G. V. Black on the physical characteristics of the human teeth, and his further work on the properties of amalgam and other filling materials. This has been presented to the world through the columns of the *Dental Cosmos*. Another aspect of scientific advancement is the perfection of the application of cataphoresis and the cataphoretic application of drugs to the soft tissues and in the tissues of the teeth for the benumbing of sensitiveness in dentine. Dr. M. H. Cryer presented, at the late meeting of the American Dental Association, some original work on the cranium and the jaws. C. Rose has done a little work in histology during the year, supplementary to his former work.

Nothing new has been evolved in morbid anatomy or pathology worthy of note. The discovery of the X ray, by Prof. Roentgen, has promised to revolutionize some departments of surgery. So far, in its application to dental surgery we have not found anything of much practical value. The location of foreign bodies in the jaws or the antrum or some of the remote parts of the mouth and pharynx may be of value if such bodies cannot be detected by other methods already known.

So far, in the domain of dental surgery the antitoxins have not been utilized; but we think there may be here a field for their use in the destruction of morbid growths more or less inaccessible to the knife of the surgeon.

The serial article by J. L. Williams, on the structure and formation of dental enamel, has received, so far, the highest commendation; and we await its completion with impatience, as likely to throw some new light on this much studied subject. These papers were presented to the Royal Society—an unusual distinction for an American.

LITERATURE.

No strictly new dental journal has been presented to the profession in this country. A few little leaflets have appeared in foreign countries, the most conspicuous being the Dental Journal in Tokio, Japan. One Japanese journal has been issued for several

*Read before the Illinois State Dental Society.

years. The one here referred to is a new one. A new one appeared in Venezuela, also.

From year to year we find a steady growth of the transactions of societies, most of them being an account of the work done by State societies. These annual volumes grow in value, and as educational factors are not to be despised.

There is a steady decrease in the reprint work of various authors, which we heartily commend, as most of them were used as a sort of sop thrown to nonprofessional readers as an inducement for patronage much more than as educators of the public. The reprint fad is about dying out. Nowadays, when dental journals are so numerous and cheap in price, there is no excuse for reprints except in rare instances.

Here and there bodies of dentists are doing some very effective work in making addresses to the classes in public schools, more notably in Great Britain than in the United States. This work is of great value, and should engage the energies of a greater number than are now interested in it. The public press is a power for good or evil, as must have been noticed by all who are present, and the dissemination of good reading matter on physiology, pathology and hygiene as related to the whole body must prove a great benefit to mankind.

The year has not been so prolific in the output of notable works on dental subjects as some former years.

We have a new edition of Mitchell's Dental Chemistry, a new edition of Harris's Principles and Practice, an up to date volume of Catching with a new department added—Science. Prof. Frank Abbott has sent out a new book on dental physiology, pathology and practice, of doubtful value, especially the new part relating to practice. Newland-Pedley one on diseases of children's teeth and their treatment.

A new book on the pathogenic bacteria, from the hands of McFarland is excellent reading. Stocken's Dental Materia Medica, with new editors, is not as good as the last work of the original author, although it is much smaller in bulk.

Angle's little work on orthodontia comes out in a fourth edition. Senn on Tumors is an exhaustive work.

There is a new book by Miller, "*Lehrbuch der Conservirenden Zahnheilkunde*," in German. A new edition of Gorgas' Dental Medicine has appeared since the last report.

Useful Hints for a Busy Dentist, by Steele, Vol. II., came out in 1895.

Harry Rose has produced a new book on vulcanite work.

Ch. Godon and A. Ronnet have published their observations on dental education in the United States.

E. Beltrami has published a work on articulation in man, and L. Frey one on affections of the mouth. All three of the above are in French.

Th. Dreutz has published a work in Dutch, on development, E. W. Roughton one on surgery for dentists, and Hopwell Smith's papers have been republished on Dental Microscopy.

It does not follow that the best reading for professional purposes is to be found between the covers of bound books. Indeed almost any subject of vital importance to a practicing dentist is better studied from the original sources in the periodicals and in the transactions of societies. This is notably so in the search for new views on pathology, and subjects of a strictly scientific character. Some of the best work of men like Tomes, Mummery, Magitot, Miller, Black, Andrews, Williams, Peirce, Cryer, Allan, Caush, and others will be found in our periodical literature. From year to year this sort of pabulum has been growing better in quality. Nearly all the new discoveries and inventions, methods of practice and results obtained therefrom, first see the light of wide dissemination through the above agencies. We need not think that the march of progress is arrested because many new books are not brought out in every year; we should rather congratulate ourselves that time, that remorseless destroyer of senseless vaporings, will under such circumstances, pulverize the vacuities of immature authorship, and leave us only the best to add to our already large stock of positive knowledge. We are in the rapidly moving era of advancement, and it is not strange that much of what we see, hear and read should have only our cursory glances.

This committee, in the endeavor to present a few kernels from the vast amount of production, has no light labor to perform; and it is rather from a fear of presenting too much that these reports are so brief. From the day that this work was incorporated in the annual proceedings of this society can we date the gradual development of the understanding of our members; and we think that the work should be continued with slight variations from year to year, in order that the whole membership of the profession in the society

should benefit, and that these benefits should be reflected into the work and conduct of every man throughout the State. Show me a man who reads, ponders, experiments and deduces conclusions from the latter, and I will point out to you a progressive man, a good citizen and a force in his community.

Many dentists and physicians would be benefited by reading a good encyclopedia on medicine, surgery or chemistry, or one of a more popular kind. Works of this character open up vast fields not touched upon in a college course of study. The work done by these authors and condensers at first sight might appear too trivial for professional notice; but I assure you that two or three hours a week spent in this manner will fascinate you, as it did the writer, and great results are to be expected from such study as can be found in Quain, Heath, Morley, and Muir, Ashhurst, Stedman and other works of this character. I would not stop here, but after a time some special study will fix itself on you, and then you can pursue it from year to year with increasing interest and profit, not only to yourself, but to your clients and professional associates.

REPORT OF THE COMMITTEE ON DENTAL ART AND INVENTION.*

By GEO. J. DENNIS, M. D., D. D. S., CHICAGO, ILL.

Your committee reports so far as it has been able to learn the following advances in dental art and invention during the past year. By the S. S. White Dental Mfg. Co.:

A portable dental chair.

A new seamless gas cylinder made from a single piece of steel, bearing a test of 3,000 pounds, with a much greater capacity for the same weight than with the former styles.

A spittoon bracket (No. 4) without catch or spring.

An improved pedal and pitman for the S. S. White engine.

A gasometer designed to yield to slight inhalations, and to prevent waste when operations are suspended.

Tartar lithia and sulphur tablets whose use has been explained in a special brochure.

A 220 special reducing resistance.

Extracting forceps (No. 235) the beaks of which have an angular shaped cavity.

Amalgam carriers.

*Read before the Illinois State Dental Society.

Weston's xenolite cement, which is claimed to be not affected by climatic conditions and wears smooth and glossy in the mouth.

A rubber tray band forming an adjustable wall about impression trays to facilitate pouring.

A shaded pink rubber to produce a deeper color, as the distance from the necks of the teeth increases.

Pulp canal dressers of irido-platinum with flattened ovoid shaped blade, squared at the end, permitting the cotton to be readily wound about the blade, and easily removed in the packing of the pulp chamber.

A napkin holder and clamp made of nickeled steel wire covered with hard rubber to be used with cottonoid and designed more especially for posterior teeth.

Cotton pellets in four sizes.

A set of vulcanite finishers on the order of the Kingsley scrapers.

Warren dental ledger.

Dentos—An aluminum phosphate plastic, claimed to contain no zinc oxide, and the liquid, essentially pure phosphoric acid. Especial hardness, and rapidity of setting is claimed for it.

Capsicum plasters.

Additions to the Hollingsworth system of contouring dies and press.

A flask lifter and holder.

The Bosworth direct action mallet—another form of automatic mallets.

Aluminum handled mouth mirrors and examination glass.

Sheet steel in thin strips for matrices.

A dental speculum, to see by direct and reflected light the closed teeth from molar to molar.

Guaiacocaine.

Approximal trimmers for use at cervical and buccal margins.

Wire stretching pliers, by Dr. E. H. Angle, for extension and tightening of regulating springs.

Post barbing pliers.

Tooth holder—useful in grinding teeth.

Black porcelain teeth

Ransom & Randolph, Toledo, Ohio:

An anæsthetic pencil, the invention of Dr. Creager, for use in crown and bridge work and in minor surgical operations. The

holder is made with a sliding piston, which works in a cylinder and forces out the medicated point as it is worn away. The points are composed of cocaine, menthol, trinitrin, and antiseptics which readily dissolve at the temperature of the mouth.

A warm air chip blower, by Dr. Harvey. The temperature of the air is indicated by a thermometer, the tube of which is marked to show the degree of heat most acceptable to a sensitive tooth.

The Dental Protective Supply Co.:

An electric engine wall bracket, made entirely of metal, nickel plated, of ornamental design, having two bearings, removable in case of wear. The motor (110 volts) hangs in the rear of bracket on a substantial hanger; the driving shaft is attached direct to motor, obviating long driving cords and pulleys. The rheostat is fire proof, placed on the floor out of the way, and is controlled by a lever back of the chair, to which it is connected by means of wires.

The Ritter Dental Mfg. Co.:

The Columbia dental engine. The motor is encased in a neat copper ball, and attached directly to cable and hand piece. It is suspended from the ceiling by its own current cord running through pulleys and balanced by weights near the wall. The rheostat is of the round collar box shaped variety, the regulating lever permitting the foot to remain on the floor. The power may be obtained from primary or storage battery or from street current.

A laboratory motor, to the shaft of which is directly attached the chucks. It is completely inclosed, dust proof and of neat design and construction.

The Buffalo Dental Mfg. Co.:

An improved siphon for gas regulators and steam gauges. It does away with the large iron crooks and prevents rust. Claimed not to corrode. Malleable iron tongs nicked, for handling flasks.

A flask lifter, by Dr. DeHart, of malleable iron. It is a perforated iron plate to be placed beneath flasks when boiling out wax or packing rubber. To this plate is attached a handle, by which flask and plate may be lifted.

The Wilmington Dental Mfg. Co. also claims to have gotten out some new articles within the last year, but their pressure of business is so great that it is impossible for them to furnish your committee with the necessary data.

Dr. J. Austin Dunn, Chicago.:

A cervical clamp after the following description. The labial jaw passes through a slot in the lingual jaw, and is movable forward and back so as to accommodate any desired length or reach. When one jaw is being adjusted, the other will not get out of place. The lingual jaw is bent at such an angle as to form an important part of the clamp. The inner side of the beak is concaved so as to conform to the linguo-gingival ridge of the tooth. It slides under the free margin of the gum at this point and will not impinge or crush the tissues, giving little or no pain. The pivoted, right-sided beak consists of a long narrow beak, a long wide beak, and a short narrow beak. It will accommodate itself to any angle or irregularity of the teeth or tooth surface. The curve and direction of the two jaws is new, and such that when in position the labial jaw naturally takes a double bearing which prevents the usual slipping out of place. Again when the clamp is in position, the teeth of the opposing jaw can nearly close together before striking the clamp. The small bow was first designed, but at the suggestion of Dr. Cushing the large bow was adopted for more room for work. The small bow is convenient for use on small teeth.

Dr. A. S. Rudolph, Carmi, Ill.:

A dental lathe tool for finishing and polishing rubber plates. It consists of soft rubber and adjustable form on side. The abrading material is a band of emery cloth fitting over the rubber head. Expanding the head catches the emery band and holds it firmly. The rubber head may be made of any size and attached to any lathe chuck.

Dr. P. A. Palmer, Chicago.:

A clamp and wire ligature for cervical cavities. He uses soft copper wire of about 26 gauge, bent to conform to the festoon of the gum, the ends extending high enough into the interdental depressions, on either of the teeth to be operated on, that the wires may be caught by clamps with beaks fitting into these spaces. It is claimed that no leakage of the dam will occur with this appliance, and that its application is universal.

Dr. F. H. Stafford, Chicago:

An improved dental light and heater. This invention is intended to provide an apparatus for the use of dentists, comprising a gas and electric light, adjustable at the dental chair without requiring the operator to leave his working position; connected

therewith are heating devices, suitable for the several applications sometimes necessary in dental work, such as annealing gold, softening gutta-percha, or any plastic substance. By the aid of this invention the operator can perform all these processes without leaving his working position at the chair. Attached to the dental bracket it is always at hand when wanted, and is easily pushed away when not in use.

Dr. W. O. Butler, La Harpe, Ill.:

A combination steel and celluloid matrix. The steel of thickness of a clock spring tempered to springiness and some rigidity holds the thin celluloid wall next the cavity. When the filling is completed the steel band is removed, leaving the celluloid matrix in position so that the filling will not be broken out before hardening. It is useful with cement and amalgam.

Gilmer Bros., Quincy, Ill.:

A method of continuous gum, for which is claimed, first low cost, not to exceed \$5.00, less labor in construction; the use of teeth without platinum pins, low fusing porcelain, reduction of weight; articulation maintained perfectly, and a better fitting plate than with high fusing porcelains.

Dr. T. G. Wonderly, Galena, Ill.:

Partial impression cups. Upper and lower impression trays, the openings so fitted with sectional pieces that any part may be removed, allowing the teeth to pass through the openings, also a slot in the upper tray holding in position a movable palatal plate. With this plate the impression material may be easily forced against the palate. This plate may be readily bent to conform to any arch.

Dr. John G. Harper, St. Louis, Mo.:

A double pointed graver, for finishing vulcanite. It consists of an ordinary chisel with its edge cut into a V shape, giving two edges and points to work upon.

Aluminoid is a combination of rubber cement, any rubber dissolved in commercial chloroform and aluminum powder. It is used to line the palatin surface of rubber plates.

To make: Dissolve rubber, such as is used for vulcanizing, in commercial chloroform. It should be of the consistency of thick molasses. Incorporate with this about twice its bulk of aluminum powder; mix well, and this gives aluminoid. To use: Invest your model with liquid collodion, and apply the aluminoid, which

should be thinned with chloroform, so that it will flow like paint; give four coats, allowing five minutes for each to dry; allow ten minutes or more for the last coat; the case being packed close, vulcanize and finish with brush and pumice, ending with chalk.

The aluminum powder can be procured from dealers in art supplies.

Dr. W. V.-B. Ames, Chicago :

Rubber plates. Using velum rubber about the posterior edge of plates in upper cases to produce adhesion. The palatal portions of full upper plates may be done away with. In full lower cases a band of the velum rubber around all borders of the plate produces one with almost perfect suction.

G. H. Parsons, St. Louis:

An oxygen gas stove. To be attached to any gas jet. It is convertible at will from an illuminator into a broad or narrow fuel flame, superior to an ordinary Bunsen burner in heating properties.

Wilmot, Castle & Co., Rochester, N. Y.:

A dental sterilizer. It consists of an oval metal drum, $7\frac{3}{4}$ inches long, $5\frac{3}{4}$ inches wide, and $6\frac{1}{2}$ inches high. It is divided perpendicularly into two compartments. In the upper part of one end is a movable pan designed to hold the disinfecting fluid; the other end to contain a disinfecting sand.

Dr. G. A. Bronson, St. Louis:

Heavy pliers. Heavier than the ordinary pliers and useful in removing wedges, small roots, deciduous teeth, etc.

The Dental Protective Supply Co.:

A rubber nozzle or cup. To be placed over the mouth of bottle, the needle of a hyperdermic syringe thrust through it, allowing the bottle to be inverted and the syringe readily charged.

Dr. P. H. Morrison, St. Louis, Mo.:

A rubber disk and mandrel in which the disk is vulcanized directly to the head of the mandrel.

Dr. L. E. Custer, Dayton, Ohio:

In the process of cataphoresis it is found that the more gradually the current can be increased the less will be the pain to the patient. To meet this requirement a rheostat is operated by a clock mechanism by which the current is very lightly increased each second. This not only overcomes the pain produced by uneven administration, but produces as rapid results as if the admin-

istration were carried on by less frequent but larger increases. When the operator attends the rheostat himself he is prone also to push the administration faster than he would otherwise. This appliance also allows the operator free to attend to the process at the tooth. It is illustrated and described in the May DENTAL REVIEW.

It is also found that the anode in the cavity must be held perfectly quiet, and to meet this requirement a device is slipped over the ordinary rubber dam clamp which holds the platinum point firmly in the cavity. This appliance is made of hard rubber which insulates the anode from the clamp, thereby avoiding any danger of getting current through the rubber dam clamp.

When these two appliances, the clock rheostat and the fixed anode are used together in any case, the operator saves time and is free to attend to other work about the chair, he only having to see that cavity is kept flooded with the solution.

Dr. Custer also operated an instrument which he made for the direct current, whereby a cauterizing heat of 6 amperes and 5 volts can be derived from 1 ampere at 110 volts. In order to get 6 amperes in the ordinary way it has heretofore been necessary that about 7 amperes be taken from the main line. This at 110 volts is a little over 1-horse power, which in some cities is not allowable. The dentist is also paying for a large quantity of current, which is lost in the rheostat. But with the instrument shown the amperes are increased and the voltage decreased.

It is done in this way. A constant current cannot be transformed, but if that current can be interrupted or alternated it can then be. So a vibrator is put in operation which interrupts the current and by means of an induction coil suitably wound, a secondary current of high amperage and low voltage is produced. In order to lessen the spark at the vibrator and thereby make the interruptions more distinct, a Leyden jar of forty alternate layers of tinfoil and parafine paper is shunted about the vibrator.

Dr. C. W. Jones, St. Paul, Minn.:

A root trimmer and facer. It consists of an engine instrument, having at its end a concave convex tip about three-sixteenths of an inch in diameter with its concave side prepared after the manner of a rasp file. It is tempered to the hardest steel temper. In rapid rotation it is claimed to cut smoothly and quickly, easily attacking the enamel rods at their ends and breaking them along

their lines of cleavage, without lacerating the gums. Accompanying this instrument is a shield which encloses the instrument on all but its cutting surface.

A rotating knife. It is used for removing gum tissue from over the third molars. It consists of a concave disk, sharp and thin, of about three-sixteenths of an inch in diameter revolving in a stationary shield. Its appearance seems to indicate that it will be useful.

NEW METHODS FOR PRODUCING BICUSPID-BAND-CROWNS WITH
PORCELAIN FACINGS AND CUSPS.*

BY B. J. CIGRAND, B. S., D. D. S., CHICAGO, ILL.

Possibly the most useful invention recorded in the annals of dental art or science, is that of the individual crown, the basis of the successful bridge denture. Few themes have claimed the consideration of the profession with such constancy, and I dare say, few have a more enduring prospect.

The evolution of the dental crown is deserving of close study and its frequency as a subject in the literature of the profession is a sufficient criterion of its importance. This intelligent congregation of dentists, I am happy to say, is familiar with the varied evolution of the dental crown, and thus an extensive explanation of the numberless improvements in crowns, needs not solicit further consideration. Privilege me however to remind you of the classification of crowns in order that you may more fully comprehend the purpose of this paper.

The great variety of crowns which are at our command may be divided into three classes: First, those of porcelain; second, those of metal; third, those of both porcelain and metal. These three classes are again subdivided into three groups, namely, those which band the root; next those which simply rest on the naked root and depend on a post for anchorage; and lastly those which are a combination of the two former.

Of the scores of methods employed in crowning roots, none can be advocated as the universal or best, each has an undisputed territory and merit, and all have faults; and it remains for the operator to decide which of the methods, or systems is most preferable, from the point of durability, appearance, usefulness and adaptation.

* Read before the Illinois State Dental Society.

The proper construction of an æsthetic and practical crown requires much scientific information, great mechanical dexterity, thorough knowledge of proportions, a fair understanding of har-



BICUSPID-BAND-CROWN WITH PORCELAIN FACING AND CUSPS.

mony, and a sound judgment; and crown work affords a wide scope for versatility of talent and offers the widest avenue possible to the inventive genius. The varied and complex cases presented

for treatment or restoration, frequently suggest to the prosthesis, novel contrivances and methods of construction and application.

Do not infer from the proem to this paper that I am about to introduce to you a faultless crown, for I would remind you that Pope has wisely said:

"Whoever thinks a faultless piece to see,
Thinks what ne'er was, ne'er is, nor ne'er shall be."

I am fully conscious of existing defects in the crown, yet I am confident you will recognize in it features worthy of approbation.

The crown which has of late attracted attention is the bicuspid with porcelain facings; no less than fifty different methods have been advanced to produce a bicuspid crown free from the display of gold or platinum, and yet be consistent with the laws of harmony, both as to color and shape. The all gold, or telescope crowns, have in these recent years been relegated to the bygone days, and in their stead we find the more natural substitute, the porcelain. Our patients no longer desire to disclose to an observing public, that their teeth have been repaired; they dislike the mammoth gold filling or the attractive gold crown; they solicit service which can render dental results approximate to nature; and our patrons have come to believe that "'tis true art to hide art."

No substitute has a brighter future than porcelain, for it is a material in which not only the beauty of expression delights the eye and gives evidence of the highest æsthetic cultivation, but links to that beauty the additional charm of usefulness.

The crown which I submit for your consideration is a combination crown, porcelain and metal, and is anchored by means of a post. In construction it is simple and answers all requirements of a substitute. My experience has led me to know that matters recommendable to the profession should have stood the test of several years before presenting them to a representative body, such as the Illinois State Dental Society; but I have used the crown for several years and assure you I feel that the crown is meritorious in many respects. It embodies the requisites of an ideal crown, namely: durability, appearance, adaption and usefulness.

The class of roots upon which I would advise its use are the bicuspids whose crowns are badly decayed and necessitate the devitalization of the pulp. After fashioning the roots so as to leave it prominent on the palatal surface and beveling it toward the cervico-labial margin as represented in Fig. 2, prepare the pulp canal

as for the Logan crown. Then proceed to make a cope to properly envelope the exposed portion of the natural root and solder on the upper portion of the cope several platinum pins (taken from plain teeth), and on its lower surface a platinum post, as seen in Figs. 3-4; or if desired to increase the strength of the cope and further aid in anchoring the vulcanite, a small ribbon of gold or platinum should be soldered on to the superior surface of the cope as shown in Fig. 5.

After having thoroughly polished the cope, position it on the root and select the proper sized, shaped, and colored porcelain tooth, and grind its cervical margin as in Figs. 7-8, this will permit it to accurately fit the inclined surface of the cope. By means of wax placed on the cope, the tooth can be held in place and perfect occlusion can be attained. If at all possible remove the cope with the tooth still in position, then thoroughly wax up the interspace between the tooth and the cope and invest the crown in the dental flask, remove the wax and pack the space with black rubber, or maroon rubber; vulcanize the case and after giving the gold and vulcanite a polished surface, lodge the crown on the root and fasten it with oxyphosphate. This will give you a neat, serviceable substitute, free from interspaces which might lodge foreign matter.

If it is desired to produce one of these crowns so that the vulcanite will be invisible on either the labial or palatal surfaces it can be accomplished by grinding the palatal surface of the tooth and extending the lingual surface of the cope to join with the tooth as represented in Fig. 12; or by using the Howland crown (porcelain Fig. 10), packing the chamber with rubber and treating it as the preceeding case. The countersunk tooth (Crescent), can also be used to good advantage in this method of crown work as shown in Fig. 11. A crown similar in construction, yet void of vulcanite can be made by using the saddle backed porcelain plate teeth (Sibley or White); adapt a piece of gold, thirty gauge, to the concave or saddle portion and then fashion the cope so it will perfectly fit the gold on the plated tooth. After the cope has been adjusted, remove the tooth and solder the cope; then properly polish the latter and position the porcelain tooth on the cope and clinch the pins of the tooth to the cope, thus you have a metal porcelain crown without having subjected it to the blowpipe or furnace.

This crown can also be used in conjunction with bridge dentures, especially where it is intended to replace the bicuspid teeth;

the method for bridging is so near like that of crowning that it would be superfluous to enter into further description.

Those dentists who have a furnace for baking (Fig. 13) porcelain can employ this system for crown work and produce a very neat crown by making the cope of platinum, and instead of attaching the porcelain by means of the vulcanite, can do so by filling the interspace with "body" and subsequent to baking the enamel, polish the metal and a most perfect crown will result.

SHOCK.*

BY GARRETT NEWKIRK, M. D., CHICAGO, ILL.

I am not aware that a paper upon this important subject has ever been read before this society. Of course, it has often been touched upon incidentally in discussions relating to the infliction of pain.

It has come to my mind frequently in recent years that possibly we were not so generally cognizant with the subject and its special bearing upon dental practice as we should be, and that a fairly clear statement of the question, followed by the able discussion which some of our members are so well qualified to give, could not fail to be profitable.

One of the best articles upon the subject which I have ever seen is that contained in the first volume of the "American System of Dentistry," division of General Pathology, page 719, written, as you know, by one of our own number, Prof. Black. I shall take the liberty in this paper to quote from this article somewhat freely.

Dr. Black's definition of shock is as follows: "Shock is a sudden and notable depression of the vital powers resulting from an injury more or less grave, or from an impression made on the nervous system through the medium of the sensorium, as by fright, sudden and overpowering mental emotion," etc.

We may say, to enlarge a little upon this definition, that whatever is capable of producing a sudden and profound impression upon the mind, or upon the nerves, may result in serious shock; that any sudden impression which causes more or less pain, or abnormal disturbance of the circulation may be said to be of the nature of shock.

* Read before the Illinois State Dental Society.

The state of prostration which follows upon one overpowering blow, whether the blow be primarily mental or physical, may also be induced by a large number of successive small shocks extending over a considerable time, as of several hours. The term *collapse*, as it seems to me, is not synonymous with *shock*, but belongs rather to the last stage or the sequence of shock.

In the domain of general surgery shock is a matter of grave importance. Here it may be divided into two classes: 1. Shock produced by accidental injuries which require the attention of the surgeon. For a long time it was a matter of common observation, but not understood, that injuries of a certain class were often followed by collapse and death. That in other cases injuries more extensive were followed by speedy reaction and recovery. This was specially noticeable in the department of railroad surgery, where instantaneous crushing force is so often the cause of injury. To these observations, probably, we owe much of the more recent development of thought in this direction.

2. A surgical operation, undertaken though it may be for the relief of injury, is itself to be considered as an injury in relation to shock.

The idea of shock must not be confounded with that of pain. They are often associated, but they are distinct and separate things. The injury that produces shock may at the same time cause pain. The sensation of acute pain, or the mental fear and dread of pain, may and often does induce shock; or the shock of pain or of emotion may be added to that of physical injury.

But the victim of severe and dangerous shock may be entirely unconscious of the injury received. He may be stunned by the same force which produces the lesion, or in such a state of excitement as to know no pain, and yet be found within a few moments in a state of collapse. Here the discovery and general use of anæsthetics has been of great value, in that it has made it possible to subtract the elements of emotion and sensation from the sum total of shock impression. However, this subtraction is not without possible counter-addition in that the anæsthetic itself may have serious depressing influence, so great in some instances as to overbalance its benefits.

Yet, again, we are justified in assuming that the anæsthetic, by its effect on various nerve centers, modifies the essential shock of the surgical operation, so that on the whole the value of anæs-

thesia in operative surgery as a modifier of shock must be very great. It is probable that we do not appreciate this fact as we ought in our estimate of anæsthetics. Let me quote from the words of a surgeon who himself was compelled to undergo an amputation :

“Suffering so great as I underwent cannot be expressed in words. The black whirlwind of emotion, the horror of great darkness, and the sense of desertion by God and man, bordering close upon despair, which swept through my mind and overwhelmed my heart, I can never forget, however gladly I would do so. In spite of the pain, my senses were preternaturally acute. I still recall, with unwelcome vividness, the spreading out of the instruments ; the first incision ; the fingering of the sawed bone ; the tying of the blood vessels ; the stitching of the skin ; and the bloody, dismembered limb lying on the floor. These are not pleasant remembrances, and could I even now, by some Lethean draught erase them, I would drink it, for they are easily brought back, and they cause a disquiet which favors neither mental nor bodily health.”

Another has said, “Truly, before the days of anæsthetics the patient preparing for an operation was like a condemned criminal preparing for execution, and in many cases the foreboding was just ; exhausted by pain and dread, the victim died under the knife. In vain surgeons assured the world that ‘pain should be considered a healthy indication,’ that ‘pain in the majority of cases is even desirable, and its prevention hazardous,’ that ‘it was a trivial matter to suffer,’ and that ‘pain has always its usefulness.’ Human nature, unconvinced, shrank increasingly from the agonies of surgery.”

Let me say here, parenthetically, that there is another point in this connection of which we think too seldom ; and that is the different influences of the old and new conditions on the surgeon himself.

The great surgeon, Cheselden, has left on record these words : “If I have any reputation I have earned it dearly, for no one ever endured more anxiety and sickness before each operation.”

Undoubtedly his anxiety would have been much less, his sickness mostly avoided, the state of his mind and nerves far better, chances of success greatly increased, could he have used anæsthesia. Verily, surgery was heroic then in more than one sense.

For the study of the question as to what shock really is, or may be, what changes, molecular and otherwise, take place in consequence, I cannot do better than to refer you to the article of Dr. Black already mentioned, which I hope you will all read once again at your first opportunity.

I will only refer to one or two leading propositions, for it is my purpose, as before intimated, merely to open up the subject rather than to discuss it in any direction exhaustively.

First, as to molecular changes and impressions. Undoubtedly, special changes and impressions are made in every instance. Usually, they are not of great importance, and scarcely enter the domain of the pathological. But they may, and perhaps they do oftener than we suspect. To illustrate, let me relate one instance recently come to my knowledge, that is of special interest to the dentist.

A gentleman in Chicago has a sister residing in another city of whose experience he gave me the following account :

Some twenty years ago she was in the dental chair for three or four hours at one sitting. During this time she was kept practically in one position, with her mouth continuously open. The operations were painful, but she was determined to endure them to the end, which she did by the full exercise of her will. At the end of the sitting she was in a state of collapse. She was ill for weeks. But the unique feature of her case is this : The most distressing symptom at the outset was difficulty of swallowing, and she has never since been able to take solid food. From that day to this, she has been compelled to subsist on a liquid or semi-liquid diet. Now it is evident that in this case there must have been produced a definite and continuing modification of structure in some central ganglion.

That many patients are thus affected by what I may call the *accumulative shock* of dental operations there can be no doubt ; not often to the same degree perhaps, not many so peculiarly, yet to an extent more serious than we are apt to suspect.

I have in mind now two persons, a mother and her grown up daughter, neither of whom can endure ordinary dental operations without shock so severe as to threaten collapse. The elder has had severe experiences of various sorts, has passed through a six months' period of nervous prostration, and all these things added to her constitutional tendencies make it positively dangerous to

attempt anything more than mere palliative treatment for any dental trouble. Her daughter begged me at her last sitting to use cement, saying that hitherto at the conclusion of every series of gold operations she had been seriously ill for several days, and at one time a whole month. This leads me to say that a very important question for us to consider in everyday practice is that of temperament and susceptibility. There is as much difference in beings of the *genus homo*, as in those of *equinus*. No one would think of treating a thin skinned, fine eared thoroughbred as he might a long haired unimpressible Potawattomie pony. Infections one may bear with scarcely an impression may be sufficient almost to drive the other insane. We are much inclined to treat patients as children are treated in the schools, all the same by a stereotyped plan, regardless of individualism. This is all wrong, and here we must reform.

One cannot judge of the fact or the degree of shock by the voluntary acts or movements of the patient, for as Dr. Black has well said, the patient "may be possessed of a calmness that is entirely unnatural." There may be no movement, voluntary or involuntary, to indicate that serious consequences are being evoked by the operations in progress. If the dentist shall fail to bear in mind the temperament and susceptibility of his patient, and, being all engrossed in the mechanical execution of his work, cease to be observant and watchful, he may come to the realization very suddenly that he is responsible for grave complications.

The immediate danger in shock appears to be in its relation to the vascular system. Through temporary paralysis of the vasomotor nerve centers, there is extreme dilation of the arterial vessels generally, and it is supposed that in fatal cases death results, not so much from failure of the heart to act, but because blood is lacking for the heart to act upon, and, as Dr. Black remarks, the patient "bleeds to death without the loss of a drop of blood." The heart is emptied into the relaxed blood vessels.

Therefore, the first and most prominent symptoms of shock pertains to the circulation of the blood. There is first pallor of the countenance, a weak and small pulse followed by dullness of the senses, a staring eye, numbness, coldness of the extremities; lack of will and muscular power. Questions are answered by monosyllables or not at all, there is partial or complete loss of consciousness, in short, collapse.

In this connection, I desire to mention a cause of shock as I believe which has been but little recognized as such, namely, the action of drugs. I have a patient who exhibits all the primary symptoms of shock if a bottle of chloroform be opened in the room. A friend of mine has a patient similarly affected by camphor. These are examples of idiosyncrasy, but there are agents, deadly poisons we call them, which cause death apparently by shock pure and simple. They so impress and suddenly paralyze the vaso-motor centers that the heart is bled to death by the relaxed blood vessels. Possibly this is what cocaine and other agents of that class probably do.

Having said enough, as I believe, to evoke free discussion, I will close this paper, adding only that these considerations come to us laden with caution. We must be on our guard at the chair, avoiding protracted operations with those who are unfit to undergo them, whether by reason of temperament, idiosyncrasy, nervous exhaustion, anæmia, or what not.

If a patient comes to us who has had trying experiences, unusual stress of toil, grief, anxiety, or previous illness, one whose vital tone is low, with susceptibilities acute, *beware!* Keep to the safe side and avoid *shock*. If, however, in spite of precaution a case of shock shall overtake us, our remedies are suggested by our pathology. As the great vessels of the abdomen and lower extremities are the chief reservoirs of blood in cases of shock collapse, inversion, or semi-inversion of the body is of first consideration. Call on gravity at once to throw the blood to the heart. If this be not sufficient apply heat to head and spine, hands and feet, ammonia to the skin and nostrils or internally, kneading of the muscles, etc., etc. Electricity, if available, might be useful when other means prove inefficient. But, as dentists, *avoid* producing the condition, and remember first of all that our greatest danger lies in the line of accumulative causes that belong to prolonged sittings and exhaustive operations.

I believe that the great majority, if not all, of dentists are guilty more or less of malpractice in this direction.

Patients not knowing themselves, request or even demand prolonged sittings which ought not to be given them. Mothers bring their daughters, semianæmic it may be, at a critical time of life, and ask that we shall do a certain amount of work for them in a limited time. We operate for one of these, say thirty or

forty minutes. She endures so much very well. But we may see if we are observant that she has about reached the limit of nervous endurance for that time. If we discharge her now, she will easily recover from the limited shock experienced, and she will return cheerfully for her next appointment. But the mother says, "I am anxious to get through with this work. I cannot spend so much time for short sittings. While she is here put in another filling." If we say *No!* we deserve a medal. If we yield to please the mother, and because we have the time which we should otherwise lose, we deserve to be horsewhipped.

But it even more frequently occurs that the mother will ask or demand for herself operations beyond the limit of prudence.

It is my opinion that extra-susceptible children or young people should not be kept in the chair as a rule more than half an hour at a time. Adults (usually they are women) not more than an hour, as much less as may be. We prepare too many cavities and fill them at one sitting. We do not use temporary stoppings of gutta-percha as frequently as we should, waiting for recuperation from shock. We think possibly not too much of teeth, but too little of the individual behind the teeth.

NEW OUTLOOKS OF DENTISTRY*.

By C. E. BENTLEY, D. D. S., CHICAGO, ILL.

A retrospect of the art and science of dentistry fifty years ago reveals these twin sisters of progress struggling amid a "sea of troubles," surrounded by superstition and selfishness, distrust and disfavor. The march of progress of the profession in this short span of time has been phenomenally rapid and prolific. Superstition has disappeared, as the luminous rays of education have advanced; selfishness has been converted into true altruism; distrust has given way to the confidence begotten of fraternity, and the respect which is ours by virtue of well-earned laurels has caused disfavor to hide its head, while dignity and independence claim their own. To-day we stand in the midst of a vigorous and lusty manhood, with faces turned toward the rising sun of our expectations, our past triumphs adding new zest to the hopes that spring up within us.

*Read before the Illinois State Dental Society.

To-morrow's vision should reveal a broader horizon, a clearer sky, bringing with it renewed energy and purpose.

The nineteenth century is about to close upon an epoch making period in the history of dentistry. It is what the tendencies presage that inspires this paper. They are the logical results of an aggressive and truth seeking set of men, whose zealous efforts are responsible for the suggestiveness implied in their work.

The new outlooks in dentistry are important in proportion as they relate to the prevention of those diseases with which we now contend, and some of which we so imperfectly understand. The dental colleges throughout our land will either retard or accelerate this condition in proportion to their alertness to respond to the ever awakening impulses which will lead to this position, thereby stimulating the weary plodder and the ambitious student alike to explore virgin soil.

Permit me in a somewhat desultory fashion to glance with you at two or three phases of recent suggestions in dentistry. I have not wished to frame an exhaustive inventory of our gains, but rather to note such features as can be led to wider beneficence through forces which we may ourselves administer as we go about our usual tasks.

When we attempt to group the various diseases with which we deal, according to causation, our hypotheses soon become clouded with conflicting data, resulting in conclusions more or less speculative. In spite of the vast stores of experience with the human body in disease, clear down to the early part of the last decade, the nature and cause of some of the most common and fatal human maladies were practically unknown. Likewise has it been with dentistry. Caries of the teeth has presented a varied history. Some teeth decay rapidly, in others the progress is slow, difference of progress often occurring in the same mouth. Again, in some cases caries never occurs, and in some progressive caries seems to be spontaneously arrested, while in others it is persistent throughout life.

To one man more than to any other in our profession belongs the credit of directing our attention to that most important new outlook in dentistry, serum pathology and therapy. I refer to the Nestor of the dental profession, Dr. G. V. Black. Here is a field fruitful of suggestion and far-reaching results. To me this is one of the most pregnant suggestions that has come to

the dental profession since the proposition of Robertson announced in 1835, that caries of the teeth was caused by acids, the results of fermentation.

Little or nothing is known of this subject at present. It has been simply suggested. It portends a constitutional dyscrasia, which may affect the fluids of the body, thereby affording the most favorable condition for the acid fermentation necessary for the decay of the teeth. Whether they act upon the teeth in their circulation through them or not, is not known.

You cannot fail to see the far-reaching results of this suggestion. If developed it should not fail to stimulate the most sluggish imagination. It means a larger knowledge of physiology, pathology, chemistry and bacteriology directly applicable to our profession. It may mean a therapy, the exact character of which may be a specific against dental caries. It will mean a great deal more than our contracted vision of to-day can encompass. It appears to me this suggestion will take us back to the cell pathology suggested by Virchow years ago. Somebody has said of Turner that he was a man who thought in paint. The modern devotee to dentistry, if he seriously thinks, must think in cells. Evolution teaches us that through long processes these cells acquired peculiar forms, and have adapted themselves to special functions, each doing its particular work, and all acting in harmony for the maintenance of the life and performance of the body as an independent being. As to the vivifying influence which set this machinery in motion we are not likely soon to know. But this we do know, that all the things the body does, from the high borderland achievements in thought and memory down through the homely processes of nutrition and repair, are accomplished by these small life units, in accordance with physical law as definite and unvarying as are those which we trace in plant, and earth, and star.

The text has been announced, who will preach the sermon?

Another outlook which seems to portend much for the dental profession is dental and facial orthopedia. This specialty has developed so rapidly in the hands of a few men that its possibilities are practically unlimited. This specialty essays not to be satisfied with the correction of malposed teeth only, but extends its sphere of usefulness to facial deformities, the results of irregularities of the teeth and jaws, and by the scientific application of force to the osseous structure, metamorphose a once un-

gainly and deformed face into one pleasant to contemplate. May not this specialty compel its devotees to look into the possible causes of these deformities, and drive them into that awakening science of osseous deformities, to which criminologists have recently contributed so much? If these deformities be largely the result of constitutional causes, subjects of a profound scientific nature come within their province. If these stigmata be indicative of degeneracy, and the subject so afflicted will tend more toward disease than the person not so afflicted, as is claimed, what a contribution to the science of dentistry will be given, if this can be proven by devotees to this department of our art! Standing upon the threshold of hope, we shall anxiously await the results of this new outlook.

Comparative dental anatomy is a science the importance of which is slowly but surely dawning upon the dental profession. At the risk of being misunderstood, I venture the assertion that the great body of American dentists have advanced but little beyond a high ideal of office practice. This is reflected in some of our best dental societies, when we hear the remarks upon scientific papers, to the effect that "that is not practical, etc., etc." As a distinguished member of our profession truly says, when one studies the human teeth with the view of making the knowledge serve the ends of a vocation in life, it is merely professional study; but when one commences an examination of the general subject of dentition that the area of human intelligence may be broadened, that is real scientific work. But few of our dental schools have considered comparative dental anatomy of sufficient importance to add it to their curricula. But I sincerely hope to see, before the close of the nineteenth century an awakening along this line and more deference shown so important a basic principle of true dental science. Men of mental training and studious tastes and habits are entering the dental profession, and they demand a broader teaching than they have received in the past; they desire to be real professional men in the fullest sense, and a good proportion desire to explore the field of pure cognate sciences. The dental colleges should stimulate that desire. Comparative dental anatomy occupies an important place in the scale of the sciences, and yet there is not an accepted authority upon these subjects in our ranks to-day. We lay claim to a part of the broad field of science. It is our opportunity to cultivate it, and the world will hold us

responsible, if we neglect it. The great discoveries made in this department must be made by us, or ours is the shame. Our dental schools should and must offer the stimulus and opportunities to those who are to illumine this special portion of our scientific field.

Hypnotic suggestion for the amelioration of pain, is an outlook of which we have reason to expect much. The results of experimenters in psychological laboratories have caused the skeptical world to halt in its flippant disposal of this department of science, and forced a respectful recognition of what promises to be a boon to humanity. Psycho-therapy, or suggestion, or call it by any other name—is destined, I believe, to be a useful product of the army of investigators, who are to-day toiling in the laboratories throughout the world. When reduced to a science, the art of its application will be appreciated by no class more than by the dental profession. Psychologists tell us that pain is not a condition *per se*, but the conception of a mental or bodily injury. If this proposition be true, you cannot fail to see some of its far-reaching results. If you shut off the *perception* of an injury, pain will not exist. This hypothetical declaration has been demonstrated to the satisfaction of many persons, many times. This statement, then, under proper conditions seems to be true. If it be truth, how eagerly we should seize upon any instrument for its demonstration. When we consider that impressions made upon the minds of our patients are those suggestions which are made through the five senses, we can begin to perceive the vast import our manner, address, personality, and character bear to the mental suggestion sustained by the patient. The introduction of psycho-therapy into the practice of dentistry, by those who understand its principles, if it effect no better result, will at least induce a mastery of self and patient by the creation of an atmosphere in which the patient has the fullest confidence of the operator, and vice versa. Immunity from pain by suggestion is possible only under these conditions. I greet this new light at its dawning with a hearty welcome, trusting to the ever onward tread of science to bring new light, new hope, and as each throb of expectancy wells up in an anxious breast, some new truth for the relief of suffering humanity.

One of the tendencies of our day is toward preventive medicine, and our hope for a very wide curtailment of suffering and a large saving of the teeth to the human family is largely dependent upon the development of this tendency. If only the people can

have an elementary knowledge of the human body, and of such principles of hygiene and sanitation that exist under the increasingly complex conditions of modern life, they may be able to guard against common forms of infection and against unwholesome modes of life and many ills that follow as a consequence. It seems to me that here the public schools have great responsibilities. If the public schools will respond to the growing demand for a larger knowledge of the structure and working of the human frame, we can confidently hope for the installation of competent dentists into the schoolroom, who may make examination of the mouths of the children and advise them as to the correction of any pathological condition that may exist. It will also afford a fruitful source for data collection upon a wide range of subjects, the importance of which cannot be overestimated.

These outlooks, notable enough though they be for any age, are to be solved only by such patient research and guarded inference as all science has learned to trust, and the only chance for the full and speedy fruition of our hope in them lies in the zeal, ambition, and honest endeavor of our profession to convert these outlooks into realities, to become the common property of the profession. Of course shadows here and there will linger still. One and another for some time to come will invest his calling with puerile practices which were fostered in ignorance, while quacks will flourish, and more or less well-meaning persons will become their patrons. But after all, when dentistry is once placed where it belongs, close to its sister disciplines, from which it gathers light and in its turn inspires, the shadows are certain soon to fade, and the truth to prevail. Our responsibilities, then, become the greater to see to it that these outlooks become the handmaids of our science.

Let us then heed the inspiration given us by Turgot, who says: "In directing the forces of your mind to the discoveries of new truths, you fear to go astray. You prefer to remain quietly in the opinions most generally received, whatever they may be. That is as much as to say that you should not walk beyond doors, for fear that you might stumble and break your legs. But in that case you are in the position of him whose legs are already lamed, for yours are useless to you. And for what has God given limbs to man, if not to walk with them, nor given him reason, if not to use it? It is not error that opposes so much the progress of truth; it is indolence, obstinacy, the spirit of routine, everything that favors inaction."

CERVICAL FILLINGS AND CLAMPS.*

BY J. AUSTIN DUNN, D. D. S., CHICAGO, ILL.

Doubtless all will agree that the preparation and filling of cervical cavities or cavities beginning at the gingival line and extending rootward are difficult and to be dreaded principally because of the lack of satisfactory means with which to expose the cavity and hold the rubber dam securely in place so as to be able to manipulate with freedom and ease. The many failures of cervical fillings are no doubt due to this fact. This will probably explain the reason why we are all so much interested in anything new pertaining to cervical clamps, and so I judge you will be more interested in the clamp I am to present than anything which might be said touching the preparation and filling of this class of cavities.

For more than three years I have spent not a little time and money in the effort to construct a clamp that would more nearly meet the requirements for cervical cavities, and my efforts during most of this time have been rewarded with productions no better than those in use. I must confess that I was somewhat discouraged but through the encouragement and suggestion of friends, and especially Dr. George H. Cushing, I have succeeded in producing results which so far have proved very satisfactory. The object which I had in view was to construct a clamp which would embrace the following essentials: First, a clamp simple in mechanical construction; second, one that could be easily and quickly adjusted; third, one that would not unnecessarily crush the soft tissues; fourth, one that would give the least pain to the patient; fifth, a clamp that would be stable and would not move out of place; sixth, one that would be less in the way of the opposing teeth; seventh, a clamp that would accommodate itself to any angle or irregularity of the teeth or tooth surface.

The clamp which I present to you to-day consists of an outer or labial jaw and an inner or lingual jaw. (Two parts.) The labial jaw consists of a loop or bow adapted to encircle the cavity, so that free access may be had thereto, and is provided with a projecting part or arm adjusted to engage the lingual jaw. The lingual jaw is doubled upon itself so as to produce a loop, the rear end being bent downward so that when in position it is substantially parallel with the labial jaw. The projecting end of the labial jaw

*Read before the Illinois State Dental Society, May, 1896.

passes loosely through an opening in the loop joining the two jaws together, and is provided with a screw threaded opening through which passes a screw adapted to engage the projection on the lingual jaw.

Fig. 2. The lingual jaw is bent at such an angle as to form an important part of the clamp. It has a peculiar curve and is so arranged with relation to the labial jaw and the shape of the teeth that when placed upon a tooth it naturally takes a triple bearing (*i h f*), which is necessary to the stability of any clamp, and therefore provides against the usual rocking or slipping out of place when in position. The rear end of the lingual jaw is curved downward and then upward over the incisive edge of the tooth, so that the slot through which the end of the labial jaw passes is very nearly on a line with the labial surface of the tooth, which allows

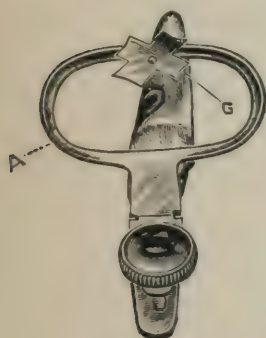


FIG. 3.

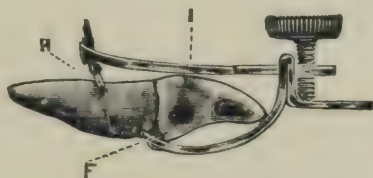


FIG. 2.

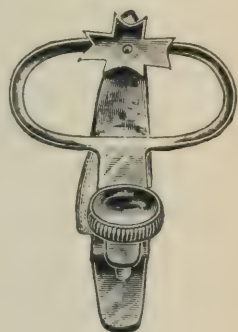


FIG. 5.

the labial jaw to slide upward and downward and on a line parallel with the long axis of the tooth. The contact points on the labial and lingual sides of the tooth (*i* and *f*) are nearly always on a line opposite each other and tend to hold the two jaws together and clamp in place, so that the pivoted beak (*h*) is practically independent in its movements.

It will be seen that the rear end of the curve of the lingual jaw, as just described, containing the controlling device is out of the way of the opposing teeth so that the mouth can be sufficiently closed to be at rest, besides the tendency of the opposing teeth to strike the end of the clamp and force it out of position, giving more or less constant pain to the patient, and annoyance to the operator is very much modified if not largely overcome. The end of the jaw that engages the lingual side of the tooth is concaved on its inner side (Fig. 2 *f*), so as to conform with the linguo-gingival

ridge of the tooth. When the end of the jaw or beak is constructed in this manner it conforms to the shape of the tooth and when in position will not tend to draw or pull the clamp out of place when the thumbscrew is tightened. This construction also allows the clamp to be placed in different positions on the tooth, as the beak will fit the linguo-gingival ridge even when necessary to move and set the clamp at an angle from the straight line in order to accommodate adjustment to irregularities of the teeth. The contact end of the lingual jaw (Fig. 2, *f*) instead of being bent at right angles, as is frequently the case, is given a gentle curve, as shown, which allows it to slip under the gum without giving the patient unnecessary pain.

The unique feature in this clamp consists in the fact that the labial jaw is provided with an adjustable beak with eight bearing surfaces, of unequal sizes, consisting of a long narrow beak, a long wide beak, a short wide beak and a short narrow beak, each a circle contact, and four surfaces describing a quadrant circle to be used especially at the mesial or distal angles on the root surface (Fig. 3 *g*), so as to conform to any size tooth surface or angle. The beak is pivoted to the jaw so that any of these bearing surfaces may be used when desired.

Since the beak is pivoted to the jaw it moves with relation thereto, and hence when in engagement with the tooth will conform to the shape of the tooth and allow a firm grip of the tooth without throwing the clamp out of position, which is the natural consequence or tendency when the beak is rigid with the jaw. In attaching the clamp to the tooth it is slipped to position over the tooth and by a turn of the thumbscrew the beaks are made to touch lightly, then with the index finger of the left hand on the pivoted star beak the labial jaw is pulled into place and tightened. It will be seen that by moving the labial jaw it may be made to accommodate any desired apical length or reach. The adjustable pivoted beak when in position always rests upon two outer points as indicated (Figs. 3-5), hence always accommodates itself to any irregularity of the teeth or tooth surface, thus allowing the clamp to be used on the side of the tooth as well as the center. This beak always firmly engages the tooth, whatever the shape of the surface, and hence when the set screw is tightened the clamp is fixed and steady and there is very little tendency at least for it to move to a different position. This result cannot be obtained when the beak is rigid with the jaw.

The lingual jaw of the clamp just described is set to the length of the longest tooth, the beak is concave, the ridge is convex and it is not easily dislodged. The least pressure will hold it in place no matter how far the labial beak may be pushed upward; therefore, this disproves the necessity of an adjustable lingual jaw. In other words, there is an absence of any tendency of the lingual beak to push beyond the linguo-gingival ridge at this point. Doubtless this will be appreciated because of the fact that most of the pain caused by cervical clamps is due to the impinging and crushing of the soft tissues on the lingual side.

DISCUSSION.

Dr. GEO. H. CUSHING : *Mr. President* : I was asked to open the discussion on the subject of cervical cavities and their treatment; but this is merely the description of a clamp. I hardly know what to say in this connection except to remark that I think the clamp is a good one. I have not had the opportunity to test it personally as to its application to the teeth. It seems to me to be the most efficient and best adapted clamp for this class of cases that I have ever seen. The description of it you have heard, and the clamp is here on exhibition. Of course, we all recognize the importance and absolute necessity of a clamp of some kind which shall enable us to fill these cavities with success, and I think this will do so with less pain and inconvenience to the patient than any other with which I am familiar.

Dr. DUNN : I do not know that there is anything I can add to what has already been stated in my paper but replying to Dr. Cushing I will say that he is correct in saying that nothing was said with reference to the treatment of cervical cavities. For the reason that the question has been considered with reference to a suitable clamp, which means the transforming of a very difficult and troublesome operation into a simple one, so that comparatively speaking there is very little of importance to discuss.

In closing I wish to say that I make no claim as to an ideal clamp, but I do believe that the lines of construction and the principles involved in this clamp are in the direction of the ideal, and if it *marks only a step* in advance as a means to making better cervical fillings, the conservation of the soft tissues, greater comfort to ourselves and less pain to our patients and suffering humanity, I shall be satisfied.

CATAPHORESIS.*

BY W. W. MOOREHEAD, D. D. S., ALEDO, ILL.

From the beginning of the history of dentistry to the present day much time and labor has been spent by our profession in endeavoring to relieve our patients from the pain and suffering brought on by the practice of dentistry.

A majority of the people as a rule look upon our offices with a greater or less degree of horror, and few indeed are the patients who do not dread to make an appointment with their dentist. To have our patients know that it is possible to relieve them from the pain and suffering of operations on their teeth would be to have them come to us for appointments with their minds relieved from that fear of being hurt, which I might say has ever been the curse of our profession. And it would also relieve the operator's mind when he is about to fill an appointment with a nervous patient whose teeth are in a hypersensitive condition.

Time and again have we tried to benumb the sensitiveness of the dentine by the use of caustics and desiccants, and some have even resorted to the use of general anæsthetics, but we all know too well the result of these applications. At times we have been successful in treating sensitive dentine, but in a majority of cases we have found that a sharp instrument in the hands of a skillful operator was the best, and most reliable obtundent.

The result of these failures has caused the profession to become skeptical about any new method that you may allude to for benumbing the dentine.

To have within our power a method by which we can control the sensibility of dentine, and to be able to manage some of those uncontrollable cases, is an object that has been sought for by all progressive dentists.

By the use of cataphoresis I think we have a method by which we can control and obtund the most sensitive dentine.

Several of our dental journals have recently contained articles on the subject just referred to, with your permission I shall quote from them: The definition of cataphoresis as given by Dr. Wm. J. Morton is this: The movement of fluids together with the substances they hold in solution from the positive pole of the electrode conveying a continuous current in tissue toward the negative pole.

* Read before the Illinois State Dental Society.

It is the flow of fluids from the positive to the negative pole. He also states that the effects of a medicine placed at the positive pole extends only half way. Thus if you place the positive electrode containing cocaine on one side of the gum, and the negative electrode on the opposite side, the effect of the cocaine will extend only half way; the opposite side will be hypersensitive rather than anæsthetized.

In a recently published edition of Bigelow's International System of Electro-Therapeutics we find an article by Dr. Frederick Peterson claiming that cataphoresis is purely a physical process.

Thus he says: Physically, and not physiologically, it is almost certain that electrical endosmosis is a mechanical and not an electrolytic effect, for two reasons: first, the action will show itself in any single solution whenever a porous partition, such as plaster of Paris, stoneware, etc., is inserted in the path of the current, even when no electrolysis is taking place, that is, no composition; and secondly, because the phenomena may be stated as follows: Whenever a capillary tube containing a liquid sustains a difference of potential between its extremities, liquid is transferred through the tube toward the cathode. The following facts will explain the character of the process in a clearer and more popular form. If two compartments separated by a membrane are filled with a fluid, and in each an electrode is placed, there is a streaming of the fluid through the septum in the direction of the galvanic current, that is from the positive to the negative pole, so that in the course of time there is an increase of fluid in the negative compartment.

Naturally this osmosis, as is well known, occurs between two dissimilar fluids, the direction of the osmotic current being from the lighter to the denser liquid. But if the anode is placed in the denser liquid, and the cathode in the lighter, this natural osmotic current is not only overcome, but reversed.

This streaming movement is analogous to that taking place in the semisolid sarcolemmal substance of muscle when subjected to the constant current, and observed under the microscope, a visible flowing of the contents of the muscular fiber from the positive to the negative pole.

Some may think that the cataphoric action of electricity is a new thing, but such is not the case. The idea of introducing medicines into the system by the action of the galvanic current originated long ago.

Richardson employed it to introduce medicine into the gums for the purpose of extracting teeth in 1859. Beard and Rockwell in their work on medical and surgical electricity refer to several gentlemen who claim to have carried medicines into the system by the use of electricity.

Owing to the extreme sensitiveness of the dentine, an apparatus that can be used at other points cannot be used on living teeth. To use cataphoresis on living sensitive teeth it is absolutely necessary that you have an instrument by which you can at all times have perfect control of the current. We must be able to raise this element from a weak to a strong current by such minute gradations, that it will be almost imperceptible to the patient.

Such an instrument or rheostat is now manufactured by the Electro Therapeutic Company, known as the Wheeler fractional volt selector. With this selector you may use a battery of about thirty cells, or the Edison 110 volt street current.

After connecting the selector with the battery, or street current, place a strip of blotting paper which has been saturated with a solution of iodide of potassium on the binding posts on the top of the selector, and the positive pole will give a reddish spot. To this pole attach the platinum pointed or positive electrode, to the other pole attach the negative, or sponge electrode.

The connections having been properly made you are ready to use medicine by the process of cataphoresis.

Always adjust the rubber dam, insulate any metal fillings that may be close to the cavity you wish to operate upon, this may be done by coating them with temporary stopping, or chloro-percha, cut away the walls of the tooth just enough to gain access to the cavity ; in which you may now place a pellet of cotton saturated with the obtunding solution you prefer to use ; give the patient the negative, or sponge electrode saturated with a weak solution of salt water, and instruct them to hold it in the palm of the hand or on the face, apply the positive or platinum pointed electrode to the cotton in the cavity, and sometimes it is necessary to moisten this during the application of the current.

Begin with a current that is at first imperceptible to the patient, turn on the dial on top of the selector slowly, and at some point between four and eight volts the patient will experience a slight pain, at this point allow the current to run a few minutes and then raise it slowly to the number of volts that may be re-

quired to produce the desired anæsthesia. Owing to the difference in the resistance that people of different temperaments offer to the electric current, it is impossible to designate the number of volts that may be required for each case. It is not necessary to use a strong current in cases of exposure of the pulp, or in young patients.

But by prolonging the application, and using a high degree of voltage, we can benumb the dentine deep enough to cut into the pulp without causing the patient to flinch. Now that we have reached the number of volts we wish to use, you must not turn off the current suddenly, but gradually, until the dial indicates zero.

The time occupied in producing anæsthesia varies from six to twenty-five minutes. Occasionally you find a patient who is extremely susceptible to the current; for such cases use a low degree of voltage, and a prolonged application.

I will now refer to a few cases from practice:

Case 1. Anterior approximal cavity in left upper central incisor, involving at least one-third of the cutting edge, dentine sensitive.

Treatment: Cataphoresis for fifteen minutes, using a 25 per cent solution of cocaine, reaching a maximum of twenty volts. Result, absolute freedom from pain when using a bur. As I wished to use a screw post, I made a second application, which occupied about six minutes, with this result: absolute freedom from pain while anchoring the screw.

Case 2. Large approximal cavity in the left superior cuspid, condition of tooth such that I had decided to destroy the pulp. Treatment: two applications of cataphoresis, using the solution of guaiacol cocaine "recommended by Dr. Wm. J. Morton," for twenty two minutes, reaching a maximum of eighteen volts in each application. Result, painless removal of pulp and the root and crown were filled immediately. I also wish to state that there was no inflammation or soreness after this operation.

Case 3. Approximal cavity in left upper lateral incisor, patient very nervous, dentine hypersensitive. Treatment: cataphoresis for twenty minutes with guaiacol cocaine, reaching a maximum of twelve volts. Result, almost entire freedom from pain, the patient insisted that I was not cutting in the sensitive part of the tooth, even when I was using a bur in the cervical portion of

the cavity. By the use of a 25 per cent aqueous solution of pyrozone, discolored teeth may be easily and thoroughly bleached. To prepare this aqueous solution for cataphoresis, McKesson & Robbins recommended that you take of 25 per cent ethereal pyrozone two parts, water one part, evaporate the ether, then add a small quantity of salt, "1 or 2 per cent," and it is ready for use. Before attempting to bleach a tooth it is necessary that the apex of the root be filled with gutta-percha, or some nonconducting material to prevent the current from carrying the solution through the tooth. Ethereal solution of pyrozone cannot be used for bleaching by the process of cataphoresis because they are nonconductors. Much stronger currents may be used in bleaching, than we would use in benumbing the dentine.

The instruments necessary to introduce medicines by the process of cataphoresis may be obtained from the Electro-Therapeutic Co., 32 East Twenty-third Street, New York, or from the Galvano-Faradic Mfg. Co., of the same city.

The advantage of cataphoresis over other methods of introducing medicines is that you can carry your solutions not only into soft tissue, but through solid dentine. Many medicinal solutions are nonconductors, and to use such solutions by the cataphoretic process you must add to them a substance that will cause the same to become electrolyte. Thus Dr. Morton adds 1 minim sulphuric acid to about 2 drachms guaiacol, and to pyrozone we would add salt or soda, say about 1 per cent.

It is not necessary that we should be electricians in order to be successful with cataphoresis, but it is absolutely necessary that the operator should take enough time to make the application in a careful and thorough manner. To all such operators I would recommend cataphoresis with the assurance that they and their patients will be benefited many times thereby.

Usually one fifteen minute application will permit the entire preparation of the cavity, but if much cutting is necessary it is advisable to make a second application; some may think this process takes too much time; to such I would say, "Let cataphoresis alone."

While I do not claim originality for this method of producing anæsthesia, yet I do assert that it has enabled me to assure my nervous patients that it is possible to fill their sensitive teeth without pain.

PROCEEDING OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

Tuesday May 5, 1896.

The meeting was called to order in Jewelers' Association rooms, Columbus Memorial Building, at 8 P. M., the President, Dr. Ottofy, in the chair.

The discussion of the question "Should not the Appointment of Dental Examining Boards be under the Control of the State Dental Societies," was then opened by Dr. Geo. J. Dennis :

On first thought the reply to this question would be an affirmative one based on the following proposition : The State Dental Society represents the best element of the profession of the State.

If this be true (and no one will scarcely contradict it) its knowledge of desirable candidates for the positions of State examiners is a more intimate one than can be the case under the present method of appointments by the governor of the State. It can more readily determine the qualifications of candidates, can secure the elevation to these positions of men of known fitness, and prevent the retention of those entirely without the qualities necessary to the office. It can more easily direct the creature of its own creation ; hence, being a representative body of the best in the profession, its power for the advancement of dental thought is enhanced. It can almost directly influence the standard of education required by the examining board of its candidates for admission into the profession, and thus the standard required, through this influence must be gradually elevated.

The efforts of the State society, in conjunction with those of a board of its own appointment, would result possibly in legislators being more readily shown the necessity of more stringent laws for governing the practice of dentistry.

With more stringent laws to control admission into the profession, the quality of the men entering it, as well as their services after admission, would be improved. The public, it is believed, would quickly appreciate the improvement in the services rendered, and with greater appreciation of services would follow increased stimulation on the part of dentists to higher attainments. With dentists of highest attainments serving the people, the people must be benefited. This is the objective feature of all law, and if in this particular instance the object may be gained by the ap-

pointment of State examiners by the State society, it should be done by all means.

Another strong reason that the appointive power be vested in the State Dental Society is that of the removal of this board from the pale of political influence. In the minds of some, this constitutes the strongest argument that can be advanced in favor of a change from the present method of appointment. All that is bad, all that is tending toward chaos and the downfall of our institutions, in their opinion is the result of political action.

Again, it would appear to be a wiser plan that authority in professional matters be removed completely from the hands of one whose knowledge of the needs of each particular profession and of the benefits it confers upon the people must of necessity be limited.

On the other hand, it is contended that the State Dental Society is not a representative body, since less than one-tenth of the dentists of this State at least are members of this society. It is not even geographically representative, since two-thirds of its members reside in one section of the State. It is also contended that the most influential members of the State society are members of the faculties of various dental colleges, and by virtue of their influence, should they desire to commit the State Dental Society in the appointment of examiners who would serve their interests, they would have no difficulty in doing so. Although State societies, and our own State society in particular are as a rule free from intrigue in the placing of certain of its members in positions of prominence, yet such a charge could easily be made, and the statement would receive credence whether founded upon fact or not.

While acting for the public good the State society without especial difficulty, might require of its appointees such a standard of requirements that the entrance of well qualified men into the profession would be practically prohibited. The effect of the State society selecting the examiners, instead of influencing legislators toward better laws for the protection of the public would more probably be that of opposition rather than of assistance. On its face and to men who are constantly confronted with the words trust, and combination, it would to be only another form of combination for the benefit of a few.

The appointment of examiners by the State society will in no wise lessen the mistakes in appointments, since it is a well-known

fact that bodies of this nature will often vote hastily on the spur of the moment, and at the suggestion of a single person.

Finally, can the members of the examining board, which is supposed to be selected to represent the wishes of the people in the matter of dental services, act contrary to their desires as expressed through their representatives in the legislature. The State society which is a progressive body, organized for the advancement of its own members in their own especial work, is not a representative body in any sense of the word, nor does it express the wishes of the people, or even the sentiment of the whole profession of the State. Its function is that of elevating its own members and indirectly those members of the profession with whom they come in contact. It has not the power, neither should the power be vested in it, of saying to the dentists of the State, of which it is a small minority, "Thou shalt, or thou shalt not." It is contrary to the spirit of our institutions and a perversion of constitutional rights. Suggestions to the Governor or others in authority by the State society of its wishes in the matter of appointments to the examining board would be no violation of these rights but the placing of the appointments directly into the keeping of a society which is a law unto itself, and responsible to none but itself would be clearly a violation of these rights. Few instances of the abuse of the appointive power on the part of the chief executive of the State have occurred, neither are they likely to occur. His personal responsibility to his constituents will always be such that he dare not abuse his power in determining selections of this character. This is a feature of our government, that of personal responsibility of its officers to the people. Our State society recognizes no such responsibility, neither of its members individually or collectively. Hence it should not control appointments to the State examining board.

These in brief are a few of the arguments for and against the question before you. I leave it with you, for further discussion.

Dr. CUSHING: I do not know that I am prepared to say definitely what my judgment would be in regard to the propriety of making the State societies the sponsor for appointments. It was urged in the argument of Dr. Dennis as against that, that the State societies should not appoint. My idea is that they should not appoint, but that they might be made responsible by furnishing to the Governor the names of a large number of candi-

dates from whom he can select. I think that would overcome to a very great degree the objection that was urged of that character. In some of the States, I think in New York, the appointing power lies with the State society, does it not? I think they nominate and the Governor affirms.

Dr. DENNIS: That is the case in New York. The State Dental Society is the sponsor.

Dr. CUSHING: I do not think that should be so, but my suggestion that the State society hand the Governor annually a number of names from which to select, would be the proper way to get at it. I think that would rob the objection of its most serious force. It was urged as one of the arguments against this method, that the State society is not a truly representative body, either of the field at large or of the profession at large. That is unquestionably true, and yet I do not know that we should stop legislation on that account, because it is confessedly true that the State society must furnish the best representation of the profession at least, I do not think anybody questions that, although it is not numerically the majority of the profession of the State. I do not know that I am quite positive about the matter in my own mind, but my impression is that the appointment as I suggested, from a number submitted from the State society to the Governor would be the proper way of reaching that sort of thing.

Dr. HARLAN: The answer to that question in my mind would be, no. For the reason that the State Dental Society does not represent the dentists of the State, although the best talent in the profession may be in the State Dental Society, but the attendance is not the same year after year.

One of the statements made by the first speaker who opened the discussion is a very true one, that very frequently societies are dominated by one or two or three powerful wills. That is always the case. The Senate of the United States is an example of that, and the House of Representatives. There are 423 members of the House of Representatives of the United States and probably there are not twenty men, not more than twenty men who take a real active live part in guiding the policy of the whole House of Representatives. It is the same way with the State society. The State Society is an irresponsible body, that is another reason why I would not be in favor of having the State society appoint. I think in general the intelligence of the Governor, the executive of

the State, with advice and assistance of the representatives of the profession, will be a safer guide in the appointment of members of the boards of examiners than any State society, or any dozen societies in a State. In New York State they have eight district dental societies, each of those district societies selects one person to represent it, and the State society confirms the appointment, and consequently the appointment is, so to speak, made from the different districts in the State. But now I believe that this appointment has to be, by the new law, concurred in by the regents of the University of the State of New York, consequently it becomes a truly educational body in that sense, so that we first have the district society to nominate and elect men to send them up to the State society, the State society is composed of delegates from several districts, they go to work and elect and the regents of the University of the State of New York confirm, so in that way they have somewhat of a representative board of examiners.

Nearly all of the States that I know anything about from reading and from observation where the members of the society appoint or at least name the men and the Governor appoints, I say nearly all of them are weak boards. I do not think I care to particularize, but I know it of my own knowledge that the very strong boards are those appointed by the direct executive authority, where there is responsibility, and I believe that that is the true way. The State Medical Society does not appoint or recommend; State boards of health are not appointed in that way. Why should there be an exception in favor of the dental profession? It may be true that the Chicago Medical Society and The Illinois State Medical Society, and the various medical societies in the State of Illinois may know better the qualifications of the men to serve on board of examiners, but still the good sense and patriotism and judgment of the executive of the State must be depended upon to fill offices created by the legislature.

I do not believe it is constitutional to have an irregular body, even though it be incorporated, which cannot sue or be sued; I say I do not believe it would be constitutional to have a State society assume, or if a law were made so that the State society should have the power, I believe that if it went up to the higher courts, they would knock it out, they would say there is no basis for that, and on this ground I am opposed to it.

Dr. MENGES: Dr. Harlan covered the ground well. I held

an entirely different opinion. Experience is better than theory. I care not how well qualified a man may be, or how plausible his theory may seem, absolute experience is the safest test, and Dr. Harlan I think is acquainted with the majority of the State boards, as well as with a large number of the dentists of this country, and if his conclusions, after knowing these facts, is that our weaker State boards are those appointed by societies, I believed in a poor theory. Now my judgment is entirely different.

Making a comparison for instance of the dental and medical State boards, there is a vast difference, as well as between the men constituting the medical and the dental profession. We have here and there a man of good strong mental vigor in the dental profession, but in the medical profession we find them by the score. For the dental profession has become really a profession only in recent years, whereas the medical profession is the oldest of the professions, and the latter has invited the attention and the best talent that the world can produce from the beginning of history till now. The fact is that the people at large, do not hold the dental profession in very high esteem, they think that all there is to it is plugging up a cavity, extracting a tooth and making a plate. The result is that any sort of man will do for an examiner, they all think that it is simply an office to be filled.

Those of us who are making a study of the profession at this time, who are looking at it from a scientific standpoint, realize that there is a vast difference between what the qualifications of a dentist should be and between what it is generally estimated that they should be. The better educated even among the educators of our State do not think it requires much to be a dentist. Tell a man to educate his son to be a dentist. What, a dentist? I remember well, speaking to a banker a number of years ago, speaking of his son choosing a profession and I said, I believe I would make a dentist of him. That was before I was thinking of becoming one myself. He said, "For the Lord's sake, a dentist. Well, what is your idea what a man should be? Anything but a dentist. There is nothing in that." That is the aspect that many of our best men have of the profession of dentistry. If that is true, our governors think about the same and they look more for political qualifications. He must live in this locality, must be of this nationality and of this class; and if he is, that is all that is necessary for a dental examiner. That I know to be the case in many instances, and I think it is all

wrong. If we expect to have the profession stand strong and firm, we must have a competent dental examining board, and we must assist that board by proper laws, in order to get a good examining board, I feel that the governor should have named to him a certain number of representative men so he may make his selection from that list. I believe in that theory; it may not be sound but it is my judgment.

There is one question touched upon further, regarding the appointment of members of faculties on State examining boards. My judgment is that the only man really qualified to sit on a dental examining board, is a capable, bright man connected with some dental college. I do not believe that a man who is away from educational influences; who pays no attention to educational matters, is qualified to sit upon a State board. He may be ever so bright, he may have had a good education when he left college, and he may have read for a time in a general way; but let him be out for ten years, and he is not qualified. If we expect to have an able examining board, its members should be selected, if possible, from colleges located in that State. I have been interested in college work for some few years since I have been connected with the profession. I am not afraid to take an intelligent man from the Chicago college or any other college. I am interested in a certain college, but I do not look with disfavor on the appointment of men connected with other colleges, not if they are intelligent gentlemen; there is no danger from that source. On the contrary, I would have more faith in those men, because I would have more faith in their ability and judgment. Unless we have men who are able to pass correctly upon the qualifications, upon the answers to questions that the candidates may give, the State board is a farce, nothing else, and to have men who are qualified to examine the facts, they must be men who are actively engaged in the work of dental education.

THE CHAIR: I would say in regard to the present condition of affairs in the State of New York, where they are supposed to have advanced the farthest of any State, the Board of Regents is appointed by the legislature without compensation and for life. The members of it are supposed to be from the best element of the State, and at the present time they are really the examiners for license in the State, and they simply appoint one man in each district to whom they send questions. The examiner simply sees to

it that the student has answered the questions; he then passes upon them according to his own judgment, sends them to the board and the board reviews them, and if satisfactory to the board, the license is issued.

The discussion on the following topic: "Should not the granting of Certificates of Qualification by Examining Boards to nongraduates be generally abolished?" also proposed by the American Dental Association, was then opened by

Dr. MENGES: I would like to have a vote taken now and have every man cast a ballot on that question; I would like to see how many of us are in the negative and how many in the affirmative. It is not possible for a man, if he is looking at this question intelligently, if he is looking into educational matters, if he is looking to the building up of the profession, to see more than one side to that question. It looks to me as if it is not even a debatable question. The word "generally" I think should not be there. The word "absolutely" should be there in its place, and then the answer should be in the affirmative. What are the facts?

The nongraduates, we will make two classes of these, one, the student passing through college, and the other a practitioner of some eight or ten years' experience, changes from one State to another and would like to have an examination to receive his license to practice. There are cases of men, eminent in the profession, who have no diploma, they are not graduates, and yet they are qualified to practice. There is no question on that proposition, and they should be given that privilege. After a man has practiced for eight or ten or fifteen years or has attained a certain position in the profession, then it would be perfectly right for him to take the examination, and it is proper to extend to him the privilege, but on the average the man of ten or twelve years' experience, without any dental education is not the equal of a junior in any well conducted college, neither in manipulative ability nor in scientific attainments. I have had some considerable experience in this line and that is my judgment. There are many men present here this evening who are not graduates of colleges, there are those of us who live in great centers like the city of Chicago, Indianapolis and Cincinnati, where we have access to societies, which are simply post graduate schools, men living in those centers and taking advantage of education received from dental

societies, are prepared, they are up to the times. But the average practitioner who is located in the little country village, who has come into practice by the back door, by that I mean those who went into the office of some poor dentist as an assistant, cleaned cuspidors for six months, began extracting a little, putting in a filling here and there, made a plate and started out for themselves, know absolutely nothing of the scientific side of dentistry.

That class of dentists we have in post graduates courses, and we know what they are, we come in contact with them all over the country. There is not one out of one hundred of those men, qualified to pass any intelligent State board. Yet this man comes before this State board, comes before Dr. Harlan, Dr. Davis, members of the Illinois State board, he says: "I have moved down here to Palatine, I have a family of three children, and have friends there." The State board realizes that he can insert an amalgam filling, can make a plate and can extract a tooth, and they feel, well, he won't do very much harm down there, guess we will pass him. Whereas if they depended on the merits of this class, they know these men are not qualified at all, not one of them can pass anything of an examination. I never looked over the papers of one, but I know absolutely that that is the result. I never heard the State board say anything about it, but I know the mental make-up of the men, I know what it absolutely must be, and I know they cannot pass an examination; yet out of simple charity, out of pressure, the State board will grant them a license. Such a temptation ought not to be placed before the State board. The State board ought not to be placed in the attitude where this pressure can be brought upon it, and it should be said: "Here my good friend, you cannot take this examination because of certain requirements, you cannot come up to those requirements." And the requirements should be these.

To admit to the examination should require a diploma from a first class dental college. Every applicant to practice ought to take an examination, but I oppose that idea unless we have a satisfactory State board. The dental societies should nominate members for a State board, so that the State board would be composed of qualified men, for instance like in the State of New York, where they appoint them for life, where they cannot be removed, replaced; then require every dental graduate to pass that State board, and to make it absolutely essential that he be a gradu-

ate before he can take the State board examination. What would that do? It would cause our students in our colleges to put in every available minute to the very best possible advantage; there would be no playing hookey. A diploma would not mean so much in the eyes of the law, and it ought not to mean so much. The law as it is, places a burdensome and an unjust duty upon the college. It ought to give the colleges the privilege of graduating a man, but the man should be tested by an intelligent board after he has passed out of the college, it would result in getting the very best efforts out of the boy, if he realizes that he must be tested by the fiery State board after he gets through with the dental college.

In that connection I want to say something with reference to the colleges. I do not believe that any first-class well conducted college is afraid to have a State board pass upon its candidates. They would object, of course, if any one college had to have its students examined, if the students of the other colleges were not examined, because that would be an unfair discrimination, but a well regulated and well conducted college is perfectly willing and perfectly satisfied to have its graduates go before an intelligent board and say: pass upon these men. I would look very suspiciously upon the mental training that any college gives that is afraid to have its students tested after they have passed through. I say that no well conducted college is afraid and more than that the college would welcome such a law and such an arrangement, knowing full well that it secures the best efforts of the student of the college, thereby making him an honored member of the dental profession, a worthy student of the school, and making it better for the whole profession and the colleges, by requiring that strict adherence to the principles of the profession while he is attending the school.

Colleges are the best friends of the dentists, unquestionably. We often hear them criticised by individual members of the profession, but they do not know what they are doing. It is the colleges that are moving forward and onward and preparing these men to take these examinations and preparing them for properly entering upon the duties of the profession. Hence in answering the question, the first point is that the graduate, except in rare instances, should pass an examination. So far as the undergraduate is concerned, there is no more harmful thing than to give a student the privilege of going out and practicing a little professionally during

his school years. It seems like a help and he looks upon it like a Godsend, but it is the greatest harm, the greatest damage that can befall that student professionally, because if he gets a license he thinks he is a learned professional. When he comes back to the college he does less work because he thinks this going to school is wasting time anyhow, he ought to be up in his office making money. All a mistake. If the man has not the means to put into a college, he should wait until he has the means and then give all his time to the college. We should compel him to put vacations into a dental office under some instructor from one term to the other until he has passed through and not permit him to go out and practice for himself; there is not one man in fifty, even if he has completed his junior course, who is qualified to go out and open an office and practice. It is a damage and detriment, it is a wrong interpretation of the law. The damage is not so great in dentistry, but the Medical State Board would not say to a freshman we will license you to get out and practice, he would not be held in very high esteem. It should not be done in dentistry, and it seems to me that if we look upon what is required, what a man should know before he enters upon the practice of dentistry independently and for himself, we could not view this question in two lights at all.

As for our college work, we pass men through after three terms of six months each. If we were to prepare men properly, to enter the profession fully educated scientifically, mechanically, etc., the shortest possible time, and the time is soon coming when we will have that, is four terms of nine months each. When we have that then we will invite into the profession men of ability, men of character and men of strength, and when we turn them from the college doors they will not be afraid of this State board, and that State board, perfectly willing to go before the State board and take the examination. As it is to-day, the colleges, while they are doing the best that they can, are just barely scratching the surface. Take the students they are afraid of the State boards, many of them objecting to go before the State boards for examination. All they need in order to pass a State board is to know what this author or that author has said upon this question, state simply what you can find in the book. That is not enough to make a young man a scientific dentist. There is no original research, no original work, not at all. He is a mere skimmer, sliding along the surface and getting a little stuck to him, that is all.

What we want is to get the boys down and dig right down to the roots themselves and learn facts from original research that they make within the college walls, and not until that time does come, will we send out men who are sound and capable and make honored members of the profession. I think, gentlemen, beyond a doubt this question must be answered in the affirmative.

Dr. CROUSE : I think that if I was going to select a dentist to do my work I would take a man that had been practicing eight or ten years, sooner than the student who has just graduated. I see that there is that side to it and see the same as to the other question that was up, the law is supposed to protect the community, and the man that has practiced dentistry and never seen a college, he may know how to go through the routine of the practice very well indeed. They see a lot of things. On the other hand I have seen a lot who have gone through college that were not able to practice either. Now then if you will take your college graduates and make them submit to the examination or the requirements before they are allowed to practice, they have got to go through more than the three years' college course, they have got to go through then some kind of a post graduate course, they have got to get the experience from men who have had the experience in practice. And then I will ask any college man here, how many are there of any class that graduate that you would like to have your family go in their hands to have work done. I tell you the per cent would be small in my estimation. I do not know that I can qualify, except here and there, although I have never had the experience, but that is the way it strikes me, and yet I think the question should be answered in the affirmative, that they should not grant certificates to men that have not gone through college, but I would make that an examination of students after they have graduated.

The following topic was then announced for discussion :
"What Results are to be expected in Replantation or Transplantation as a means of treatment of Chronic Phagedenic Pericementitis?"

The discussion was opened by

Dr. A. W. HARLAN : As long as the American Dental Association sees fit to put forward such questions, why I suppose the local dental societies will have to discuss them. One of the members of the committee I believe is the president. I present him my compliments; I think this is about the poorest list of

questions any committee ever did get out, taken all together of course. I do not think it is really worth while for the dental societies to discuss these questions, because they really all answer themselves. I think a question that answers itself is one that ought not to be propounded.

I would like to know from statistics, from reading of dental journals, from experience of individuals, how many teeth have been replanted and transplanted as a means of treatment of chronic phagedenic pericementitis. I would like to know what the statistics are on which anybody can base a conclusion. I am a pretty close reader of books and dental journals and essays in this country and other countries, and I would like to know where the statistics are. In all of the years of my own experience in the city of Chicago, in the treatment of pericementitis of that character, I do not think that I have replanted more than three or four teeth, and as for transplanting teeth into sockets of that kind, I have not any absolute statistics on that point; I have transplanted probably three. Now if that is a fair criterion of the experience of others and the results were known, why then we could discuss this question with some probability of being benefited by it.

Now in my own cases, where I have taken a tooth out and deepened the socket and replanted, the result has been an absolute failure in every one of them, because the phagocyte did not destroy the organism that destroyed the rooted tooth, so the tooth came out.

In the cases of transplantation of a tooth—and really properly speaking it can hardly be considered a transplantation unless you have the patient sit there and take his tooth out and place it in the mouth of the patient who sits there and whose tooth has been taken out. Of course, a transplantation can be made in another way, that is, you can take out the fresh tooth that has had its alveolar socket wasted away, and you can take a dry tooth, or one that has been kept sterilized for some time, and call it transplantation. What is the result? The result is that the teeth will remain firm for a little while after they become grasped sufficiently by the tissues, and then they drop out. Either they will drop out, or the roots are cut off by absorption, by tearing down. Now what the particular method of tearing roots down may be I do not know. I should say in answer to that question, which if it is intended as a beginning for the purpose of gathering statistics, why then it is a

good question ; but so far as any result is concerned to the dental profession at present, it is not a good question.

I should say that a question of whether it is beneficial to practice implantation, because we have a good many statistics scattered through the books and dental journals to show what implantation has done, but replantation and transplantation for a condition that so to speak condemns the tooth before it is taken out, it seems were idle to discuss.

Now if you take a tooth where the disease had not progressed to any extent—well, then it would not be chronic, it says *chronic* phagedenic pericementitis—there might be some benefits. I have not taken out a sufficient number of teeth for that purpose, because I thought I could do better by keeping the teeth in the mouth. There is a great deal of nonsense about treating loose teeth floating in the air. There are a great many improbable and impossible things floating through the minds of the whole dental profession. Now if you have the root of a tooth covered with a deposit until it extends from the neck, until the pulp has been smothered to death, it does not make any difference if you do remove the deposits from the root of the tooth at the expenditure of a great amount of labor and time, and if you do drill into the pulp chamber and remove the contents, whatever they may be, and fill the root, and if you do fasten that tooth to the adjacent tooth, it does not get well ; it does not get well in three cases out of one hundred, and the probability of its getting well is very much enhanced by cutting off the apex of the root, and then just as soon as you do that, this particular microorganism there eats it off, does it in the same way as in the replanting of teeth.

I have had considerable experience planting teeth in the mouth, dating back to '77. I have replanted a good many teeth, I have implanted a number of teeth, and I have transplanted some teeth, but whenever I have replanted and transplanted teeth, and have treated for chronic phagedenic pericementitis, it has been a complete, absolute, total failure. So I say, the results that are to be expected in the replantation or transplantation for the treatment of chronic phagedenic pericementitis were nil.

I do not wish to take up your time ; I do not know that I care to discuss this question any further, but if the stenographer will make a new heading for something I am going to say, I

will be glad to say it to you on something else of much more importance than the other.

A SEDATIVE.

Dr. A. W. HARLAN: About four weeks ago to-day I had a very hysterical patient in my chair, a lady about thirty years of age, who had slept scarcely any for nearly four weeks; she had to have three teeth filled and she was only going to be in the city two days. I found her physician was with her and I suggested to him that it would be a good plan to administer some sort of anæsthetic or hypnotic to her for the purpose of controlling her while I filled these teeth and she said that it was impossible to have anything done that day and so I said we would wait until next day and we would try an experiment. So the next day at twelve o'clock she came and was in the same state of nervous tension and excitement and I suggested the administration of fluid extract of Jamaica dogwood, and the physician said he was perfectly willing to have me administer that if I thought it would answer the purpose and so instead of giving the usual pharmacopœial dose, which is from 30 drops to 120, I concluded to give her fifteen drops and in ten minutes she became perfectly quiet. I adjusted the rubber dam, did not make any application to either cavities of any local agent whatever and she sat in the chair for two hours. I filled the three cavities, one in a superior first bicuspid, a very large mesial cavity, very deep, and the others in the crowns of the first upper molar and the third molar below, all very sensitive. At the conclusion of the operation she said, "I felt as though you could just cut all the teeth out of my mouth if you wanted to." I said to myself, I have accidentally discovered something that may be of great benefit to the profession, but I was afraid to jump to a conclusion too hastily and so I waited until the second day and I concluded that I would try it again. So I administered fifteen drops in water to a patient and I told the patient this time "Now I am not going to hurt you, it cannot be possible that you will be hurt at all." So I adjusted the rubber dam and dried the cavities and went to work to prepare two cavities in a cuspid, one on the labial and one on the mesial, required nearly an hour to fill those two and when I took the rubber dam off the lady said "That didn't hurt at all." I said "Really, are you sure of

it?" "Yes," she said, "It did not hurt at all." And she said too "You could just cut off all my teeth." Repeating the remark the other lady had made. So I tried that nearly every day, for blondes and brunettes and various temperaments to see what the effect would be, and I found by increasing the dose that the hypnotic effect was lost, it did not control the pain if I gave thirty drops, then they were all awake, if I gave sixty drops they were intensely awake and in one case I gave 120. So from something like about forty administrations now in from fifteen to twenty drop doses up to this time I have not had a single failure. I say up to this time. I do not say but you will have a failure the very first time you try it or that I may have a failure the next time I try it.

Now the fluid extract of Jamaica dogwood is just like any other dangerous drug, it may affect the weak hearts, it causes the features to become flushed slightly more than usual; it slightly dilates the pupil; it will require from one drachm to two drachms to produce sleep, but under any ordinary circumstances it would not be a wise thing to administer one drachm or one and one-half drachms, or two drachms to a patient for the purpose of excavating a cavity in a sensitive tooth, but I think somewhere between fifteen and twenty drops of the fluid extract of Jamaica dogwood is about the place where we have a tolerably reliable sedative and so, as I have received so much from the dental profession myself in various ways, I am very glad to present this little matter to you for the purpose of having you try it.

Now you must remember that in the use of any drug internally that while under certain circumstances you might administer 120, 130 or 140 grains of hydrate of chloral, that about 15 grains is considered to be the safe dose and so under certain circumstances you might give from 75 to 105 grains of iodide of potassium, yet 10 grains would be sufficient unless you wanted to produce a profound impression. In the administration of opium under certain circumstances you might give from 30 to 60 drops of the tincture of opium, but ordinarily 15 drops would be quite sufficient. So I say, in connection with the administration of fluid extract of Jamaica dogwood, which is made by Parke, Davis & Co., from 15 to 20 drops will be a safe dose for you to begin on.

THE CHAIR: How soon does the effect take place after administration?

Dr. HARLAN: From five to ten minutes.

A MEMBER: How much water do you use?

Dr. HARLAN: About three times as much water. I have not extracted a tooth with it, I have extracted a pulp, however.

A MEMBER: I would like to ask if there were any after-effects.

Dr. HARLAN: The patient does not lose consciousness at all and does not have a headache or any ill aftereffects except they are not hungry at the next meal. One lady told me that she had saved two meals by having this administered. In case of any bad effects the antidote would be the same as for opium and any stimulant, but fifteen to twenty drops is absolutely safe.

A MEMBER: What would be the indication?

Dr. HARLAN: Of course I have not seen a case of poison, but in all the books that you can consult on the subject you can find that it has been recommended as a substitute for opium for various purposes, and the antidote would be the same, and I do not recommend any body to use more than twenty drops and if you do not use more than that you cannot have any bad results. In the West India Islands the bark and roots of this tree are used freely. You will find that in the extra pharmacopœia, 1891 edition. In Hare or Wood you would not find anything about Jamaica dogwood, but you will about American dogwood. In Hare's you will find very little about it, in Potter's very little, in Brunton just a small note. I have consulted everything with reference to it to find out what others have to say. It is still a nonofficial drug, so that it has not got into the United States pharmacopœia, that is, to be recognized.

I removed a pulp the other day for a woman forty-five years of age, and she was under its influence. I am not making any extraordinary claims for this at all, I am simply telling you what I have seen and experienced myself.

Dr. CROUSE: I know there is a drug that they used to kill fish with; they have passed laws in some of the States; Pennsylvania has a law against the use of it. I have forgotten what the drug is, I know there was such a law there; they got to taking fish out of the water in that way in great quantities by either hypnotizing them or drugging them.

Now, coming back to the other subject, that announced for discussion. The speaker took upon himself to criticise the com-

mittee. Now I think that is a useful subject to have discussed, because the committee opens up one more phase of the treatment of pyorrhœa. That has not been discussed much, all the other phases of treatment have been discussed on all sides, there is one which has not been discussed much. Now, I think it is just as feasible, and I would expect to cure a case as easily and truly by pulling the tooth and putting it back again as to leave it loose to wiggle around, with the root at the end that you could not get off, and I think we have cases of pyorrhœa that we might call chronic, that the teeth are not very loose and yet be a chronic case, had not got very bad. But there is not a doubt in my mind but that there is more humbug in the treatment of pyorrhœa at this time than almost any other thing practiced, that is following a line of treatment that you do not get any benefit of finally. If there is the deposit at the end of the roots, such as is described in the last statement, nothing short of Divine Providence could cure it and make a sound case of it. That is my honest theory of the case, and whether you extract the tooth or not. I had supposed, however, that the practice was somewhat more general, or practiced more than the last speaker seemed to indicate. Quite a number of years ago it was advocated considerably, taking the tooth out and scraping the roots and putting them back again. That is a cure I have never practiced. I never had any faith in that so I never practiced it. So far as the question is concerned I think it is just as well probably after you take the tooth out and see it is in that condition, that you do not put it back any way, and save the patient all the trouble.

CRIMINAL ANTHROPOLOGY APPLIED TO PEDAGOGY.

Lombroso (*Monist*, October, 1895,) in a lecture before the teachers of Turin expressed his conviction that the systematic study of the characteristics of school children, physical and mental, would bring about a genuine revolution in the prophylaxis of crime. He points out that the inclinations of the child are almost the same as of the adult rascal but usually disappear as the age advances. In some instances, however, these characteristics are conspicuous and continue to be more prominent, in which case there are associated physical peculiarities, and it is in the detection and pointing out of these possible criminals of the future that Lombroso thinks the teacher can do so much truly useful work. Similar views were expressed by Dr. Harriet C. B. Alexander in a paper read at the March meeting of the Chicago Academy of Medicine.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY

EDITOR: A. W. HARLAN, M. D., D. D. S.

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LOCAL ANÆSTHESIA.

From time immemorial the thought in most dental minds has been to secure immunity from pain in excavating dentine and removing pulps. Beginning as early as 1858 (or perhaps earlier) electricity has been used to deprive dentine of its sensibility; but it is only in the past six or seven years that the possibilities in this direction have begun to be realized. D. F. McGraw was one of the first to state that cocaine could be driven into the dentine to deprive it of sensibility. (See DENTAL REVIEW, Vol. III., page 169.) Since that date others have worked in this field; Morton, Custer, Jennings, and others. The apparatus for this work has been greatly perfected, notably by Morton, Custer and Jennings. It is rather surprising to find that a new Moses has appeared who claims, substantially, in the *Times-Herald* of May 27, to have made a *new* discovery, that cocaine can be driven into the dentine. We think that it is about time to enter a protest against such procedures, and give credit where it is due. Dr. W. V-B. Ames, of Chicago, has also done some work in this line, following McGraw, as early as 1889. The fact that proper divisions of the current could not be made effective until 1895 is no discredit to the originators of the first experiments. Electrical cataphoresis is a fact not only in producing local anæsthesia, but in other lines; and we would caution dentists everywhere not to buy rights or make licenses to use processes, when all the benefits may be derived from machines now being made, upon which there is no toll. It is not easy to foretell the possibilities in this direction. We urge every one to try the process of obtunding by cataphoresis

where it is possible to connect with a street current. (See the paper of Dr. L. E. Custer in the May number, and Dr. Moorehead's in this issue.)

M. PAUL DUBOIS.

It is with sincere regret that we announce the sudden death of M. Dubois, which took place in Paris, early in April, as the result of a bicycle accident. It had been our fortune to have known M. Dubois for fifteen years. He was one of the founders of *L'Odontologie*, and the editor in chief for many years past; a graduate of the Dental School of Paris, and later an underprofessor, and finally professor. He was a voluminous writer, and the author of a work, *Aide Memoire du Chirurgien Dentiste*, which has reached its third edition. He was one of the organizers of the Dental Congress of Paris, 1889, and the editor of the transactions of that congress. He was a member of the Medical Congress of Washington, 1887, and one of the enthusiastic workers for the Paris Congress in 1900. Dubois was industrious and persevering; a man of genial manner, and commanded the friendship and respect of those with whom he came in contact. He had done his part nobly and well in the uplifting of the science and art of dentistry in France, and through the journal which he controlled, had stimulated many minds to the production of much that was of value in science and literature. His loss will fall heavily in that circle composed of Lecaudy, Godon, Kuhn, Blocman, Ronnet, Papot and others, by whom he was ably supported on every occasion. We pay our tribute to his memory by saying that our personal sorrow is great, and we feel as though we had lost a dear friend and brother in his demise. *Requiescat in pace.*

DEPOSITS ON ROOTS OF TEETH.

On two occasions Dr. Geo. H. Cushing has written articles entitled "A Blot on the Profession;" the particular blot referred to being the neglect of many dentists to carefully and fully remove salivary and serumal deposits from the roots of teeth. Dr. Wm. H. Trueman has dissented from Dr. Cushing's views, in a manner to indicate that he (Dr. Cushing) might be drawing on his imagination or on the unsupported statements of patients, etc.

Dr Cushing returns to the charge that it is a "blot" and in a very temperate manner renews his former statement, that this department of practice is neglected. We agree with him in this matter, judging from what we see, not from what we hear. Nearly every day some one comes in with a tooth so hopelessly loose, that nothing remains to be done except to take it out. These teeth are usually in the mouths of persons who have been in the care of dentists.

If dentists *do* properly remove such deposits, and if they *do* it often enough, why *do* the teeth become loose? We think Dr. Cushing and a few others ought to hammer at this subject, until such operations are done as well and thoroughly as "contour" fillings and porcelain faced crowns, and other nearly perfect operations. The "blot" can be removed when earnest, honest, careful work is done in this line. Dr. Cushing ought to keep at it himself, if he does not get the aid and encouragement of others. We support him in his efforts to awaken interest in this subject.

THE AMERICAN DENTAL ASSOCIATION.

This year, the first Tuesday in August, the above association will meet in Saratoga. It is expected that many good papers will be read, and the place assures a large attendance. Are you going?

DOMESTIC CORRESPONDENCE.

ANCHORING APPROXIMAL FILLINGS.

CHICAGO, March 4, 1896.

TO THE EDITOR OF THE DENTAL REVIEW:

Dear Sir: The very courteous and considerate criticism of my method for anchoring approximal fillings in incisors, by Dr. C. N. Johnson in his paper read before the Chicago Dental Society, December 3, 1895, and published in the January number of the DENTAL REVIEW, I hope and trust will not deter the dental profession at large from a careful consideration, and unprejudiced trial of my method. Not because of the fact that it originated with me, but that it may stand upon its own merits, or come to naught if there be no merit in it.

It should not be strangled in its infancy, and thus deprive it

of an opportunity to develop its good points. The accompanying cut illustrates a gold filling which I inserted for one of my patients to-day, and just here I wish to state that I am becoming more and more enthusiastic over this method of anchorage.



Dr. Johnson, in his paper referred to, claims that the life of the pulp is endangered by cutting a groove across the lingual enamel plate. Dr. A. H. Peck and others in their discussion of said paper took the same view regarding it.

Not being present on the occasion referred to, I had no opportunity for replying to these gentlemen, all of whom are regarded as authorities in matters pertaining to dental practice. I wish to ask these gentlemen, why condemn any method without a trial, from a purely theoretical standpoint?

I do not wish to be understood as advocating my method for every case that is presented, but that it is the best known method for many cases I do not hesitate to affirm with earnest enthusiasm.

To be more explicit, I will state that I regard this method better adapted than Dr. Johnson's favorite method, for incisors that are quite thin labio-lingually, and his method which is so ably defended by Dr. Peck and others, as best adapted to incisors of greater thickness.

Endangering the life of the pulp is a phase of the matter to which I gave much earnest thought and consideration before I made my first venture in this departure from old methods of anchoring proximal fillings in incisors. My first operation of this kind was performed with feelings of some apprehension. I proceeded cautiously, but finding that a groove sufficiently large to afford strong anchorage could be made without so much as a twinge of pain to the patient, and that being the result in every instance in which I have operated upon this plan. I had come to the conclusion before writing you on a previous occasion, which was published in the November, 1895, DENTAL REVIEW, that the life of the pulp could not be endangered by cutting such a groove for anchorage, so long as no pain whatever is occasioned by the operation.

By referring to my other communication published in the November, 1895, DENTAL REVIEW, you will notice that I stated that

"I have been anchoring such fillings as he describes in precisely the same manner for about three years and am well pleased with results obtained," showing that while I favored his plan in cases which seemed well adapted to it, I at the same time had met with cases, which seemed according to my judgment, to demand some other method of anchorage, and this method which I am defending was the result, being entirely original with me, notwithstanding the same thought was given to Dr. Wells, of Georgia, by some supreme intelligence, who helped me out so well by giving the thought to me just at a time when I stood in special need of it.

When I speak of a thought or an idea as originating with a certain man I use the language in its popular sense.

I do not condemn Dr. Johnson's method, for it is also my method in many cases, but I simply defend my new method because I believe better service will be rendered the public by its adoption for many cases that are presented, and at the same time assist the operator in his work, for it is certainly the easiest, quickest and strongest method of anchorage for all cases like that indicated by the enclosed cut, and I will go farther and state that I believe this method should be adopted in most cases in which there is a proximal cavity in both the mesial and distal edges of an incisor tooth.

I cannot understand how any legitimate use of an incisor thus filled, could result in the dislodgment of the filling.

In conclusion, will state that in cutting the groove referred to, I do not regard it necessary to cut through into the dentine to any extent, for the thickness of enamel at the point indicated is usually sufficient to afford good anchorage, hence for this reason, and from the fact that the groove is cut without any pain to the patient, I fail to see any occasion for alarm for the life of the pulp in the adoption of this method of anchorage.

H. A. CROSS, D. D. S.

PRACTICAL NOTES.

THE REMOVAL OF DEPOSITS.

By C. N. JOHNSON, L. D. S., D. D. S., CHICAGO, ILL.

In the December, 1895, issue of the *Dental Digest*, Dr. Geo. H. Cushing calls attention to an apparent neglect on the part of many

in the profession in relation to the removal of deposits from the teeth. He takes the ground that many practitioners who seem to be careful and thorough in other lines of work are strangely negligent in the proper observance of this important detail. An editorial in the February, 1896, DENTAL REVIEW, also intimates that dentists generally are not as stringent as they should be in insisting on the cleanliness of their patient's teeth. In the March issue of the *Dental Digest*, Dr. William H. Trueman takes exception to Dr. Cushing's article, and claims that this neglect on the part of dentists does not exist to a degree entitling it to be termed "A blot on the profession," as Dr. Cushing designates it.

This, of course, is purely a matter of opinion. One dentist may think it of very slight consequence, while another regards it as of the very gravest importance; but no observing man can practice dentistry for any length of time without realizing that there is assuredly some neglect, and even if it is no worse than the neglect we see along other lines of our work, it is at least serious enough to justify a writer in calling attention to it. It has long ago been recognized that in order to work any lasting reform in dentistry it is necessary to iterate and reiterate. The profession are prone to fall into ruts, and to recede from the splendid enthusiasm and constant endeavor which are necessary to hold a man up to the highest ideal of practice. And it would seem to some that in this one thing of the removal of deposits they are more given to laxity than in anything else. Men will insert beautiful gold fillings and carefully polish them, and on the very teeth which contain these fillings will leave incrustations of calculus. This is undeniable. It has been seen too often to be gainsaid. Whether these operators fail to recognize the importance of removing deposits, or whether they are careless in overlooking them it is sometimes difficult to judge. But the facts are apparent, and no language would seem to be too strong to call a halt in favor of reform.

In another line closely allied to this many members of the profession are falling short of their duty to their patients. It has grown to be a conviction among some that the disease known as pyorrhœa alveolaris is incurable, and they have allowed this idea to dominate their procedures to the extent in many instances of avoiding any treatment whatever. This is not a full measure of justice to our patrons. We see too many instances where patients

affirm that their previous dentist had told them that nothing could be done for this disease, and that the only thing was to wait till the teeth dropped out one by one, to be made to believe that such statements are invariably a fiction of the patients. We hear too many dentists themselves affirming that teeth attacked by pyorrhœa are certain to be lost, not to feel assured that the profession generally are failing to do the best that can be done for this trouble.

No conservative man will claim that all cases of pyorrhœa can be cured, and no honest man will unqualifiedly promise a cure to his patient ; but on the other hand, no discerning dentist, who has given this matter the thought and observation its importance merits, can fail to note that many of the so-called cases of pyorrhœa will yield readily to treatment, and that a decisive and permanent cure can be effected. Not only this, but there are very few even of the worst cases where proper treatment will not result in an amelioration of the trouble, and render the teeth more lasting—and more comfortable while they do last—than if the dentist ignores the necessity for treatment at all, and allows the case to go by default. If a dentist has uniformly failed to benefit his patients in the management of these cases it is because he has not risen to the possibilities of modern treatment, and it should be his duty, and his pleasure, to refer such cases to some one who has made a special study of the subject.

The intimation given to the patient that nothing can be done is all wrong. Something can be done—in many instances a great deal—and it is our duty to see that our patients have the benefit of all that modern dentistry is able to accomplish.

It would seem, in view of these facts, that Dr. Cushing's article was well timed, and it is hoped that agitation of this subject will not cease until some definite reform is reached. Statistics compiled with regard to the percentage of patients suffering from deposits on the teeth might do much to rouse the profession to a realization of the present neglect, and some society should inaugurate such a movement.

DENTAL COLLEGE COMMENCEMENTS.

UNIVERSITY OF BUFFALO, DENTAL DEPARTMENT.

The Fourth Annual Commencement of the Dental Department of the University of Buffalo, was held in connection with the Departments of Medicine and Pharmacy, in Music Hall, in the City of Buffalo, on the evening of Tuesday, May 5, 1896. The number of matriculates for the session was 186. The number of graduates was thirty-six, as follows: Edward W. Bridgman, New York; Arthur C. Bean, New York; Charles K. Buell, New York; Sidney W. Bunting, Canada; John H. Cameron, New York; Victor A. Clapp, New York; Edmund T. Comstock, New York; Horace S. Cutler, New York; Charles S. Decker, New York; William B. Dickson, Canada; Carl S. Eaton, New York; Charles E. Featherstone, Canada; James H. Gillam, Canada; Thomas G. Gibson, Canada; Ralfe M. Harlan, California; Arthur Kidder, New York; Herbert J. Lyle, Canada; Frank G. Lugsdin, Canada; Wilhelm Müller, Germany; Emmet E. Mills, Pennsylvania; Eugene L. Martin, New York; Wesley A. Parish, New York; Paul B. H. Quedenfeldt, Germany; James M. Rainie, New York; Richard B. Redway, New York; Henry T. Squire, New York; Carl S. Starkweather, New York; Lewis P. Sanford, New York; Charles A. Stewart, New York; Walter S. Stevenson, New York; Peter A. Stadlinger, New York; Jay G. Van Valkenburgh, New York; Henry D. Warren, New York; Harry C. Webb, New York; Earl J. Woodworth, New York; Douglas H. Young, New York.

MEMORANDA.

Do you take a half holiday Saturdays?

Just now antitoxin is getting a black eye.

Dr. A. P. Chance, of Portland, Oregon, was in Chicago recently.

Dr. C. W. Spalding, formerly of St. Louis, died June 9 at River Point, R. I.

Fluid extract of Jamaica dogwood may be used to paint the gums in cases of periodontal inflammation.

The British Dental Association will hold its next meeting in London about the third week in August.

A new dental college in Pittsburgh, Pa., beginning in October. Dr. J. G. Templeton will be the dean.

Every dentist needs some outdoor exercise for health and recreation. Use a wheel, a horse, a boat or even a trolley car.

Try a little bicarbonate of soda—half a drachm in water—every half hour the next time you are taking cold, for four or five doses. BULKLEY.

Dr. J. W. Wassall has been appointed on the Illinois State Board of Dental Examiners to succeed Dr. Geo. A. Christmann, resigned.

Mr. J. H. Mummery, L. D. S., has been selected as president of the Representative Board of the B. D. A., to succeed Mr. S. J. Hutchinson, L. D. S.

French has been declared to be the official language of the next medical congress, to be held in Moscow, 1897. English will be on the same footing as German in the congress.

CANNOT COLLECT HIS FEES.

A dentist who is not licensed by the Board of Dental Examiners cannot collect a fee in any court in Illinois. All graduates who are unlicensed ought to comply with the law at once.

INTER-STATE MEETING.

The Santa Fe Route from Chicago will give one and one-third fare for return tickets to Excelsior Springs, Mo. Train leaves at 6 P. M., arriving at Excelsior Springs next morning at 10.50.

TRAVELING WOMAN DENTIST.

A New York dentist employs a woman assistant at a salary of \$50 a week and a commission, who goes from house to house and cleans teeth. The charge is 50 cents a mouth, and she does a big business.

IOWA STATE DENTAL SOCIETY.

President, F. T. Breene, Iowa City; Vice President, J. L. Whinnerey, Marshalltown; Secretary, W. G. Clark, Cedar Rapids; Treasurer, Jessie M. Ritchey, Des Moines. Next place of meeting, Des Moines, third Tuesday in May, 1897.

BOGUS DEGREES.

Who wants a bogus degree now-a-days? Many are still sold but as they cannot be registered, or accepted by examiners, of what value are they? The new concern in Wisconsin will have to get out of business soon. We publish a letter herewith on the subject.

"Which we wish to remark" the cataphoretic action of a drug is due to the harnessed electro-current, toned down to about twenty volts for from fifteen to twenty-five minutes. J. B. Francis, of Philadelphia, used it in 1858 (see dental and oral science in America, 1876), but it was not much used until 1894-5. At present many are using it successfully.

AMERICAN DENTAL SOCIETY OF EUROPE.

The American Dental Society of Europe will hold its twenty-first meeting at Dresden, Germany, August 3, 4 and 5, 1896. All members of the profession who plan to be in Europe at that time are cordially invited to attend. Further information can be obtained of the president, Dr. John H. Spaulding, Paris, or of William A. Spring, secretary, 26 Christian Street, Dresden.

"I am specially pleased to report, so far as my experience goes, that we have in trichloroacetic acid an unequaled remedy for aphthous stomatitis or canker sore mouth. These mucous patches are often quite painful, and annoying to both patient and operator. Ordinarily, one or two applications will be sufficient. In extensive cases, patients may be given a small bottle and apply it for themselves."

J. A. D.

The Executive Committee has decided to change the place of next meeting of Southern Dental Association, which was to have been held in Nashville, No-

vember next, to Asheville, N. C., the 28th of July. Headquarters at the Battery Park Hotel. We will hold our meetings in the dancing hall in this hotel. We expect a big meeting. Be sure and come. Yours fraternally,

S. W. FOSTER,
Rec. Sec'y.

Atlanta, Ga., May 26, 1896.

WISCONSIN STATE DENTAL SOCIETY.

The Twenty-sixth Annual Meeting of the Wisconsin State Dental Society will be held in the Senate Chamber, Madison, on July 21, 22 and 23, 1896. The Executive Committee has prepared a most excellent program, and a most earnest invitation is extended to all members to be present. Buy your railroad tickets and take receipt for the same in order to secure one-third return rates.

W. H. CARSON, *Secretary.*

INDIANA STATE DENTAL ASSOCIATION.

Dear Sir:—The Thirty-eighth Annual Meeting of the Indiana State Dental Association will be held in Indianapolis, Ind., in the new Dental College Building, commencing Tuesday, June 30, at 10 A. M. All members of the profession are cordially invited.

The State Board of Dental Examiners will meet at the same time and place.

M. A. MASON, D. D. S., *Secretary.*
FORT WAYNE, IND.

ATLANTA, GA., May 23, '96.

EDITOR OF THE DENTAL REVIEW:

Dear Sir: The executive committee has decided to hold the next meeting of the Southern Dental Association at Asheville, N. C., the twenty-eighth of July, headquarters at the Battery Park Hotel. Please announce this in your next issue and by so doing you will greatly oblige me. They first thought they would have the meeting at Lookout Mountain, but they could not get hotel accommodations there, hence this change. With best wishes I am Yours Fraternally,

S. W. FOSTER, *Recording Secretary.*

ILLINOIS STATE DENTAL SOCIETY.

The Thirty-second Annual Meeting of the Illinois State Dental Society was held at Springfield, May 12 to 15, 1896. A good program was carried out, and a large attendance was present. The following officers were elected:

President, C. R. Taylor, Streator; Vice President, E. B. David, Aledo; Secretary, Louis Ottofy, Chicago; Treasurer, E. D. Swain, Chicago; Librarian, J. R. Rayburn, Fairbury. The next meeting will be held at Peoria, beginning on the second Tuesday in May, 1897.

LOUIS OTTOFY, *Secretary,*
Masonic Temple, Chicago.

176 EUCLID AVENUE, CLEVELAND, OHIO, MAY 29, 1896.

Dear Doctor:—Seeing an article in THE REVIEW, about German dentists, etc., brings to mind a scheme I just unearthed and I have the correspondence, diploma, etc. Henry Casson, Secretary of State, Wisconsin, says: August 5, 1895, there was filed in his department an instrument purporting to be articles of association for forming Wisconsin College of Dentistry to be located in Milwau-

kee ; this was verified as true copy by affidavits of Oscar Abert, Milwaukee, and J. E. Zammert, Strassburg (Germany I add, because of the fact), Casson granted power to form the college.

The following December they began to issue diplomas, one was to Leonard T. Luebeck (of somewhere or other). They claimed that to make it *good* in Germany the consul must sign it, so they sent it to Chicago, but the German consul refused and so they sent it to Cincinnati and was refused again, as I had notified him that the Chicago consul had refused, and now the diploma is here. Letter head viz.: Charles L. Sonnemann, M. D., Ph. D.; J. Zammert, Strassburg, Germany; E. Schœne, M. D., Leipzig, Germany; C. F. O. Abert Zahnarzt.

I wrote Drs. Carmichael, Berry and Esau and they pronounced it a fraud. I believe it is like the old so-called college once in Delavan, Wis. You can make such use of these facts as you see fit, private or public. I am not acquainted with any of the parties, but think the profession ought to know what is going on.

Yours fraternally,

H. L. AMBLER.

25 OLD BURLINGTON STREET, LONDON, ENG.

I want to bring before your notice, that you may yourself experiment with it as a root filling, the combination of *salicylate of soda and carbonate of lead*. The latter of course is a most perfect antiseptic. The way I use it is thus: mix a little of the powdered carbonate of lead with the salicylate of soda, and then apply one drop or so of water, then manipulate as for any osteoplastic, you will find after about a minute, you can take it up, roll it into fine points, and it fills nicely into the canals, and sets *very hard*; I have been using it over one year, for the antiseptic properties of carbonate of lead, were forcibly brought to my mind when traveling abroad, and visiting the catacombs. *I have never had one case* that has turned out other than satisfactory, and I thought you might bring it before some of your societies, that it might be further tested. To me it seems to be the ideal root canal filling. There is one point I must mention, I found that out of seven different preparations of silicate of soda, I received from chemists in London only *one*, "Hearon & Squires" would produce the result, viz., a slow to set, tough filling material, that sets as hard as any phosphate filling. If therefore you should find that it will not work with the silicate you obtain, let me know and I will send you over some. The dentists over this side (excluding the American graduates) really are "too awful"; they seem to be afraid to try anything new; they do not appear to me to know the meaning of "go ahead." Have just got a "Custer Furnace" (Electric), it is indeed a gem; of course they are all clamoring to see it.

With Kindest Regards,

Very Sincerely Yours,

VOOHT DITCHAM.

REPORT ON OPERATIVE CLINICS, MINNESOTA STATE DENTAL SOCIETY.

Dr. W. G. A. Bonwill gave a clinic on filling with gold, using the Bonwill mechanical mallet. The patient provided had a superior right second molar with an amalgam filling on the mesial surface, extending over the morsal surface to the dental side. For removing the filling the doctor used a Speal pointed drill, stating that he preferred it to a bur. After the removal of the filling and discolored and decayed tooth substance, the remaining walls were very frail. All walls, except

the distal and buccal, were cut down nearly one-eighth. All margins were cut beyond the point of contact. The cervical wall of the cavity, as originally filled, extended above the gum line. This wall was cut down below the gum line; the point being to have the gum at that point overlap well the filling. All margins were smoothed with a stone. After the preparation of the cavity was completed, it was filled with wax; and the patient directed to close the teeth together. The use of the wax was to serve two purposes: First, to see if the frail walls would be well protected. Second, to serve as a guide in obtaining the proper contour. The undercuts of the cavity were very slight indeed, the walls being nearly parallel. Never undercut or groove at the cervical floor. Another point observed was the large sized bur used in the preparation of the cavity. The gold used for filling was one book No. 20 Abbey's gold foil, also some soft foil No. 5. The filling was started in the disto-buccal angle of the cavity; built across the tooth, and then forward to the mesial wall. The distal and buccal portions were built quite high before working toward the mesial portion. For condensing the gold a smooth foot plugger point with a Bonwill mechanical mallet was used. To relieve the patient from the shock of the blow, his assistant pressed against the tooth with an instrument, upward into the socket. After the filling was completed, paraffine wax was melted over all joints so that if any imperfections existed, the paraffine would be drawn into them by capillary attraction. All frail walls were covered with gold; in some places it was built so as to lap over the tooth substance, and not finished flush with the margins. For trimming the margins of the filling a pyramidal bur was used, the doctor stating that he preferred it to files, as the work could be performed much quicker, and easier to patient. Although the doctor did not finish and polish the filling at this time, he stated that for doing so he would use a piece of sheet packing rubber. During the painful portions of the operation the patient was directed to take deep quick inhalations just previous to the use of the instrument, the doctor indicating to the patient when to do so. Some one suggested that the rapid operating would be rather painful to the patient, but the doctor thought that the shortness of the time consumed more than made up for the extra amount of pain.

INTER-STATE DENTAL MEETING, EXCELSIOR SPRINGS, MO., JUNE 23-26, 1896.

Officers:—Chairman, June 23, Dr. J. P. Root, President Kansas Association; Chairman, June 24, Dr. J. S. McCleery, President Nebraska Association; Chairman, June 25, Dr. E. L. Brooks, President Iowa Association; Chairman, June 26, Dr. A. C. Griggs, President Missouri Association. Executive Committee, Dr. J. P. Root, Chairman, Dr. S. C. A. Rubey, Secretary. For Kansas—Dr. L. C. Wasson, Topeka; Dr. C. E. Esterly, Lawrence; Dr. J. P. Root, Kansas City. For Iowa—Dr. F. M. Shriver, Glenwood; Dr. F. P. Weber, Cherokee; Dr. A. O. Hunt, Iowa City. For Nebraska—Dr. H. W. Shriver, Omaha; Dr. W. A. Ivory, Wayne; Dr. O. M. Huestis, Nebraska City. For Missouri—Dr. J. T. Fry, Moberly; Dr. W. L. Reed, Mexico; Dr. S. C. A. Rubey, Clinton. Clinical Supervisors, Dr. H. J. McKellops, Supervisor General; Dr. L. K. Fullerton, Iowa; Dr. O. M. Huestis, Nebraska; Dr. C. B. Reed, Kansas; Dr. H. S. Lowry, Missouri.

Greeting:—The Executive Committee of the Inter-State Dental Association takes pleasure in announcing to the members of the dental profession that their

work is completed, and they now present for your notice and approval the program for the meeting at Excelsior Springs, Mo., June 23, 24, 25 and 26. The endeavor has been to prepare a program which would interest all, and we believe we have succeeded. The accommodations at Excelsior are unsurpassed in the West. The supplies for the physical and mental entertainment of the guests will be ample, insuring for every one a pleasant and profitable time.

Announcements.—Among the prominent men from other States will be Drs. Custer, of Ohio, and Angle, of Minnesota.

Clinicians will please bear in mind the fact that they should come prepared with instruments. Engines and lathes will be provided by the Supervisor of Clinics.

The display of electric appliances will be a special feature.

Order of Business:—First day, Tuesday, June 23. Afternoon session, 2.00. Organization, Miscellaneous Business, Essays and Discussions. Evening session, 8.00. Calling to Order, Reading Minutes, Miscellaneous Business, Essays and Discussions, Adjournment. Second day, Wednesday, June 24. Morning session, 9.00. Devoted to Clinics. Afternoon session, 2.00. Calling to Order, Reading Minutes, Miscellaneous Business, Essays and Discussions, Adjournment. Evening session, 8.00. Calling to Order, Reading Minutes, Miscellaneous Business, President's Address, Discussion, Adjournment. Third day, Thursday, June 25. Morning session, 9.00. Devoted to Clinics. Afternoon session, 2.00. Calling to Order, Reading Minutes, Miscellaneous Business, Discussion of Clinics, Essays and Discussions, Adjournment. Evening session, 8.00. Calling to Order, Reading Minutes, Miscellaneous Business, Essays and Discussions, Adjournment. Fourth day, Friday, June 26. Morning session, 9.00. Devoted to Clinics. Afternoon session, 2.00. Calling to Order, Reading Minutes, Miscellaneous Business, Essays and Discussions, Adjournment.

Essayists:—J. C. Whinnery, Omaha, Neb., "Dental Ethics," Discussion opened by A. O. Hunt, Iowa City, Iowa; C. R. Baker, Davenport, Iowa, "What do we Learn from a Study of Microorganisms?" Discussion opened by H. S. Lowry, Kansas City, Mo.; F. Slater, Rich Hill, Mo., "Care of Children's Teeth," Discussion opened by Emma Eames Chase, St. Louis, Mo.; E. Bumgardner, Lawrence, Kas., "Hereditry and Pre-natal Culture," Discussion opened by Wm. Conrad, St. Louis, Mo.; A. O. Hunt, Iowa City, Iowa, "Dental Education," Discussion opened by J. T. Abbott, Manchester; H. T. King, Fremont, Neb., "Root Filling," Discussion opened by C. B. Hewitt, Kansas City, Mo.; E. Bergstresser, Abilene, Kas., "Pyogenic Bacteria," Discussion opened by J. D. Patterson, Kansas City, Mo.; C. L. Hungerford, Kansas City, Mo., "X Rays in Dentistry," Discussion opened by W. W. Vance, Kearney, Neb.; J. D. Patterson, Kansas City, Mo., "Surgery of the Maxillary Sinus," Discussion opened by J. C. Whinnery, Omaha, Neb.; A. S. Condit, Findley, Ohio, "New Combination Plate and Bridge Work," Discussion opened by H. W. Shriver, Omaha, Neb.; W. H. De Ford, Cedar Rapids, Iowa, "Soderberg's Method for Obviating the Necessity of Removing Devitalized Tooth Pulps from Canals Previous to Filling," Discussion opened by A. W. Harlan, Chicago; W. W. Vance, Kearney, Neb., "Electricity and Its Uses in Dentistry," Discussion opened by C. H. Darby, St. Joseph, Mo.; W. H. Shulze, Atchison, Kansas, "Orthodontia," Discussion opened by E. H. Angle, Minneapolis, Minn.; E. J. Woodbury,

Council Bluffs, Iowa, "Making Metal Dies Direct from Impressions," Discussion opened by R. Mathews, Wichita, Kansas; A. H. Thompson, Topeka, Kansas, "The Variations of the Teeth in Relation to Temperament," Discussion opened by A. O. Hunt, Iowa City, Iowa; G. W. Miller, Des Moines, Iowa, "Inlays," Discussion opened by W. A. Coston, Fort Scott, Kansas; L. C. Wasson, Topeka, Kansas, "Coöperation," Discussion opened by H. J. McKellops, St. Louis, T. J. Hatfield, York, Neb., "What I Don't Know," Discussion opened by J. B. Vernon, St. Louis; D. J. McMillen, Kansas City, "The Use of Gold in Operative Dentistry," Discussion opened by E. L. Brooks, Vinton, Iowa; C. E. Esterly, Lawrence, Kansas, "Porcelain Crowns," Discussion opened by J. B. Monfort, Fairfield, Iowa.

Clinics:—L. E. Custer, Dayton, Ohio, "Electrical Fusion of Porcelain, Showing Furnace;" A. S. Condit, Findlay, Ohio, "New Method, Comprising a Combination of Plate and Bridge Work;" A. O. Hunt, Iowa City, "Treatment of Pyorrhœa;" E. L. Brooks, Vinton, Iowa, "Gold Filling in Cervical Margin of Gums in Anterior Teeth without Use of Rubber Dam;" Edw. H. Angle, Minneapolis, "Lecture and Lantern Exhibition on Dental Irregularities;" K. M. Fullerton, Cedar Falls, Iowa, "Gold Inlay in Bicuspid;" W. H. De Ford, Cedar Rapids, "Demonstrating Soderberg's Method for Obviating the Necessity of Removing Devitalized Tooth Pulp from Root Canals Previous to Filling;" "Soderberg's Pulp Mummifying Paste as a Root Canal Filling;" A. R. Begun, Des Moines, Iowa, "Gold Inlay;" F. M. Shriver, Glenwood, Iowa, "Process of Making and Soldering Bridge Prior to Placing of Porcelain Facings;" H. J. Cole, Norfolk, Neb., "Contour Gold Filling, Using Smooth Points, Demonstrating Powers' Mechanical Mallet;" D. P. Sims, Lincoln, Neb., "Gold Filling, Using Electric Mallet;" A. W. Nason, Omaha, Neb., "Treatment of Roots, Using Kalium and Natrium;" O. M. Huestis, Nebraska City, Neb., "Rapid Gold Filling, Using Crystalloid and Watts' Crystal Gold;" H. W. Shriver, Omaha, Neb., "Demonstrating Method of Setting Logan Crown;" P. H. Morrison, St. Louis, Mo., "Root Canal Filling, with Gold or Silver Wire;" C. L. Hungerford, Kansas City, "Practical Demonstration of Cataphoresis;" A. J. Prosser, St. Louis, "Soft Gold Filling;" L. E. Day, Nevada, Mo., "Plastic Filling;" W. E. Tucker, Springfield, Mo., "Gold Bridge;" P. H. Morrison, St. Louis, "Filling Mechanical or Chemical Abrasions;" H. A. Cress, Warrensburg, Mo., "Removable Bridge;" J. G. Hollingsworth, Kansas City, "New Ideas Demonstrated;" R. Mathews, Wichita, Kas., "Root Filling;" L. C. Wasson, Topeka, Kas., "Electroplating Crown and Bridge Work;" W. A. Coston, Ft. Scott, Kas., "Porcelain Inlay;" C. C. Allen, Topeka, Kas., "Porcelain Faced Bicuspid;" C. E. Esterly, Lawrence, Kas., "Method of Constructing Metal Portion of Porcelain Crown with Band."

ANÆSTHESIA STATISTICS.

Medical News, November 23, 1895, says: Gurlt (*Archiv fur Klinische Chirurgie*, bd. li, heft 1) tabulates as follows the results of a collective investigation among the members of the German Surgical Society of Berlin into the frequency and fatality of anæsthesia induced by various agents and combinations:

ANÆSTHESIA WITH CHLOROFORM.

	Cases.	Deaths.
1890-91.....	22,656	6 = 1 : 3776
1891-92.....	72,593	31 = 1 : 2341
1892-93.....	38,495	9 = 1 : 4278
1893-94.....	33,068	17 = 1 : 1946
1894-95.....	34,412	25 = 1 : 1376
	<hr/> 201,224	<hr/> 88 = 1 : 2286

ANÆSTHESIA WITH ETHER.

	Cases.	Deaths.
1890-91.....	470	..
1891-92.....	7,968	..
1892-93.....	6,213	..
1893-94.....	11,669	2 = 1 : 5834
1894-95.....	15,821	5 = 1 : 3164
	<hr/> 42,141	<hr/> 7 = 1 : 6020

ANÆSTHESIA WITH CHLOROFORM AND ETHER IN COMBINATION.

	Cases.	Deaths.
1890-91.....	1,055	..
1891-92.....	1,854	1 = 1 : 1854
1892-93.....	1,209	..
1893-94.....	3,896	..
1894-95.....	2,148	..
	<hr/> 10,162	<hr/> 1 = 1 : 10,162

ANÆSTHESIA WITH CHLOROFORM, ETHER, AND ALCOHOL IN COMBINATION.

	Cases.	Deaths.
1890-91.....	417	..
1891-92.....	2,044	..
1892-93.....	979	..
1893-94.....	750	1 = 1 : 750
1894-95.....	1,554	..
	<hr/> 5,744	<hr/> 1 = 1 : 5744

ANÆSTHESIA WITH ETHYL BROMIDE.

	Cases.	Deaths.
1890-91.....	27	..
1891-92.....	2,433	1 = 1 : 2433
1892-93.....	2,095	..
1893-94.....	2,986	1 = 1 : 2986
1894-95.....	1,426	..
	<hr/> 8,967	<hr/> 2 = 1 : 4483

ANÆSTHESIA WITH PENTAL.

	Cases.	Deaths.
1891-92.....	219	1 = 1 : 219
1892-93.....	3,8	2 = 1 : 189
1894-95.....	34	..
	<hr/> 631	<hr/> 3 = 1 : 210

IN MEMORIAM.

M. PAUL DUBOIS.

RESOLUTIONS ADOPTED BY THE ODONTOLOGICAL SOCIETY OF CHICAGO ON THE DEMISE
OF M. PAUL DUBOIS, OF PARIS, FRANCE.

WHEREAS, It has come to the knowledge of this society that M. Paul Dubois, of Paris, France, has come to an untimely end as the result of an accident on April 5, 1896. Therefore be it,

Resolved, That our members have heard of the death of M. Dubois with unfeigned sorrow and regret and they one and all desire to express to the family of M. Dubois and his confrères in France, their sincere sympathy in the unlooked for death of one who stood out in a conspicuous manner before his fellowmen and his professional brethren in other countries as one of the boldest and most aggressive men for the advancement of his profession to be found in any clime. We sincerely admired M. Dubois for his industry and perseverance, for his loyalty to his friends and his unswerving support of the right under all circumstances. We deplore his death as a loss to his countrymen and his confrères everywhere. We desire to thus publicly acknowledge the immense labor he performed in France and regret that we shall no longer have the pleasure of grasping his hand when we gather in Paris.

Be it further resolved, That a copy of these resolutions be sent to his family, to *L'Odontologie*, to the DENTAL REVIEW and the *Dental Cosmos*, and the *Journal of the British Dental Association*, for publication.

A. W. HARLAN,
L. L. DAVIS,
J. W. WASSALL, } *Committee.*

THE DENTAL REVIEW.

VOL. X.

CHICAGO, JULY 15, 1896.

No. 7

ORIGINAL COMMUNICATIONS.

PORCELAIN ARTIFICIAL DENTURES.*

By J. H. PROTHERO, D. D. S., CHICAGO, ILL.

A continuous gum or porcelain denture usually consists of a platinum base to which the teeth, in addition to being soldered to the plate, are also attached by means of a fusible silicious compound which unites the teeth and plate in such a way as to make a denture that is practically seamless.

This "body" as it is termed, is composed principally of feldspar, kaolin and silica. Feldspar is a double silicate of aluminum and potassium. Kaolin is a fine variety of clay and is also a silicate of aluminum, while silica is a silicic oxide commonly known as quartz.

These materials come to us already prepared for use as body but varying considerably in the degree of fusibility according to the formula by which it was manufactured.

In the early history of this work Allens' body and enamel were used exclusively and for the reason that it was the only material procurable.

Others have however, appeared from time to time, until now we have quite a variety from which to select.

But little modification has been made in porcelain work since Dr. Allen first introduced it about 1850, and those modifications that have been made are due principally to the introduction of lower fusing bodies and improved forms of furnaces.

This goes to show that Dr. Allen builded better than he knew,

* Read before the Odontographic Society of Chicago.

but does not prove that the methods now in vogue cannot be improved upon.

It is presumed that all have an understanding of the principles involved in making the platinum base as it differs in no wise from a swaged gold plate wired for rubber attachment on the external alveolar border. The lingual portion of the plate may be wired as in the case of the gold plate or the gum body and enamel may cover this entire surface except a portion across the back of the plate about three-sixteenths of an inch wide and extending from heel to heel. This portion is wired and doubled for the twofold purpose of stiffening the plate and forming a shoulder against which to finish the porcelain.

After swaging and usually before wiring the next step is to fit the plate in the mouth, trimming it freely at any point that will be likely to produce irritation when the completed plate is introduced.

When this is properly done and the bite taken, the teeth are ground into place and articulated.

Too much grinding should be avoided, as the best results are obtained by allowing as much as possible of the tooth and its extended portion or root, so to speak, to rest against the plate. If considerable absorption of the border has taken place it may be necessary to build up a fence or truss of platinum under the pin to support the teeth to prevent displacement during the first fusing of the body.

After the teeth are articulated, the plate should be again tried in the mouth to note the amount of material that must be used to restore proper facial contour and correct any defects of articulation that may be present. When these points are properly observed the case may be made ready for investment for soldering the teeth to the plate. All wax must be removed from the labial and buccal and to a great extent from the interproximate surfaces of the teeth in order to give the investing material a firm hold upon each individual tooth, for when the wax from the lingual portion of the plate is removed the teeth would fall out if this precaution was not observed.

The plate can now be invested and for this purpose an investment of $\frac{1}{6}$ powdered silex, $\frac{1}{3}$ ground or fiber asbestos and $\frac{1}{2}$ plaster can be used. This mixture will also be found to be excellent for crowns or bridges as there is but little shrinkage and no tendency whatever to crack.

After the investment has hardened, the wax is removed, the long pins bent down so as to come in positive contact with the plate and if any trussing is necessary it should be done at this time.

Pure gold and as little of it as possible is used for soldering, care being taken not to use an excess of borax, for all surplus *must* be removed before the baking process begins and sometimes this is a difficult matter as any one knows who has had occasion to remove it when once fused.

The soldering is best accomplished by means of the blow-pipe although it is frequently done by introducing the case in the furnace. I have sometimes followed this method and occasionally have had to resort to the blowpipe to complete the work.

After the case is cold and free from all traces of investing material, borax, etc., the first application of the body can be made. This step varies considerably according to the kind of material used.

The first distribution of Close's body over the surface of the plate should be in a small quantity. While with the Rose material much more can be added at the first application. In fact the full amount of body can be put in position and carved at once.

The body must be placed around in the interstices between the teeth and plate and so manipulated as to insure against air bubbles. The settling of the granules one against the other, can best be accomplished by distributing the body over a small portion of the plate at a time and then gently tapping it with an instrument which brings the moisture to the surface where it may be taken up with a small linen napkin. This process is repeated until the proper amount is in place.

The case can now be gradually introduced in the furnace for first baking. The length of time this step requires depends very largely on the kind of furnace employed. With the electric furnace from thirty to forty-five minutes are usually consumed in gradually heating up the furnace and fusing the body.

About the same length of time is required in using the oil furnace while with gas less time is taken up than with any of the other methods.

When the coke furnace was used, all the way from two to four hours were required to get the muffle ready for the case, much depending on which way the wind was blowing.

The first baking is never carried to the point of completely fusing the body, but is stopped while it is in a granular condition.

This is termed "biscuiting."

It requires care and close attention on the part of a novice to know when this stage is reached, but by baking a few buttons of whatever body is being used on a slab or piece of platinum and closely watching the point of fusion, the eye will soon be able to perceive when it is biscuitied.

The plate is now allowed to cool and the cracks are filled in with new body, while the general building up of the case at such points as need it is completed. It is now introduced into the furnace again and the fusing carried a little beyond the first stage but stopped before the surface of the body is glazed. It can now be withdrawn from the furnace and the enamel applied, distributing it evenly and carefully over the surface of the plate so as to insure uniform color. If carefully and uniformly applied and the baking is stopped, as soon as the piece is fused it may not require a second application of the enamel although this is frequently necessary.

With the Rose body and enamel I have frequently made a case in two bakings. This material is singularly free from shrinkage and since there is but slight tendency in this direction there is a corresponding freeness from cracks. This allows the full amount of body to be placed in position and the carving of the gums to be done at once while the full amount of enamel can be applied and carved before the second baking.

The Allen body is the most infusible of all bodies now on the market. Next in order comes that manufactured after Close's formula, and then follows the English manufactures—Ash & Sons ranking next, and Rose's requiring the least amount of heat to fuse it. Some discrimination must be observed as to the kind of teeth used with these different varieties.

English teeth of any make will bleach or lose their color under a heat sufficient to fuse the Allen or Close material, while any English body can be used with the higher grades of American teeth without incurring any risk in this respect.

English teeth can be used with English bodies and enamels with little risk of any bleaching taking place, though this *sometimes* happens even when care is exercised to prevent it.

A low fusing body with good strength and slight shrinkage will give the most uniform and satisfactory results.

In preparing the body for application it is first placed in a shallow vessel or on a flat slab and moistened with water, the surplus being taken up with a napkin, when it can be applied to the case with suitable spatulas small and delicate as the nature of the work demands. The festooning of the gum over the necks of the teeth can best be accomplished by using a common quill toothpick as recommended by Dr. Haskell, whom we all know as the pioneer in this class of work in the west. The labial and buccal surfaces of the teeth must be kept clean and free from small particles of body and enamel, and this is done with a sable brush of good quality.

It has been recommended that *distilled* water be used to moisten the body in order to prevent any tendency to discolor. This may be necessary in localities where there are salts or oxides of the metals held in solution in the water, but here in Chicago, where most of the impurities are of an organic nature, this precaution is unnecessary.

Starch may be added to the body to make the particles adhere firmly together.

I have mixed the body with oil, glue water, vaseline, gum tragacanth, lanolin and various other substances without any appreciable discoloration taking place. The object of making these various combinations was to find some material that would give stability to the body so that the carving might be more easily accomplished.

Starch and gum tragacanth have probably given the best results for the purpose mentioned.

Some objections have been brought forward against the continuous gum denture, a few of which we will notice.

One is that if a case is broken it cannot be repaired in a satisfactory manner.

To one who can *produce* a denture of this class a break of any degree can be repaired perfectly.

Another objection is that these plates produce an unnatural clinking in the mouth.

To this the answer can be made, that if properly fitted and articulated, no more clinking is observable than in any other form of denture with a metallic base. The weight of the plate is another

objection brought forward by those who frown upon this class of work. That objection seems to worry those who look with disfavor upon porcelain work more than it does those who are fortunate enough to have had their artificial substitutes made of this material.

I have fitted many cases and only recall one where the above objection was noticeable, and that case was an unfavorable one for almost any form of denture.

Still another objection and the last that we will notice is that a working knowledge of the art is not easily acquired, and that it requires a large experience to arrive at definite results.

This is undoubtedly true, but let us consider it for a moment.

Do any of us allow such an objection to stand in our way as regards other branches of dental art and science? Does not the fact of difficulties standing in the way often spur us on to overcome these obstacles, and frequently without hope of reward, even in these days when the getting of money seems, with many to be the sole object of life. Why not then turn the attention to a class of work that is to-day considered when coming from master hands, the nearest approach to nature's handiwork.

Do any of us admit that another man can prepare a cavity better or introduce a filling therein in a more substantial manner than ourselves? If we do admit that such is the case it is a tacit admission that we are to that extent incompetent. We should strive for absolute accuracy in all we undertake and be content with nothing short of perfection.

As regards experience in porcelain work, it certainly will not come to us unless we make an effort along this line, and how few there are to-day who are doing it. What field is there to-day so broad and that promises so much as this one of porcelain dental art.

It is not absolutely necessary that the beginners' work shall be of a practical nature, although practical cases will develop one more rapidly perhaps than purely experimental ones.

The carving of the gums will prove more difficult than any other part of the work, and it will require study and close observation to be able to estimate accurately the changes that will take place in passing a case through the furnace two or three times, yet this can be and is done every day by those who are enthusiastic in this field.

This part of the work must be done boldly and in a decided

manner, taking into consideration the patient's needs and temperament.

One does not need to be a natural born artist to accomplish good results, provided he apply himself in the proper direction, although one naturally gifted in this line will have a much easier task than another not so fortunately endowed. I well remember when about sixteen years old, that it was out of the question for me to draw a straight line, and to draw one line at right angles to another was an impossibility, but a little study of geometrical drawing supplemented with the same forms followed out in free hand work enabled me to soon accomplish results that before had seemed impossibilities. By gradual extension the work was made to cover the development of surfaces and the intersection of solids, and after a time I could produce from a lump of clay a rude likeness of some simple object or portrait.

And so it will be with any one who takes up such work enthusiastically and follows it persistently; the advancement will be rapid in proportion as the ability to balance form increases and the development goes on unconsciously; the hand and the eye and the brain working in unison to produce results both pleasing and profitable. But you may ask what has this to do directly with continuous gum work.

Simply this, that the better one can balance form and develop surfaces the more nearly one can imitate nature in the arrangement and disposition of the teeth and in the carving and building up of such portions of the plates as will restore the proper facial contour.

I recall the case of a patient who came to me a few years ago with an artificial denture on gold, made by a well-known dentist who was a better operator than prosthetic man.

All of the teeth inclined about 5° or 6° to the right, just as one slants their letters in writing.

The man who made the case could not draw a perpendicular line, nor could he distinguish one. Had he been able to do so the teeth would have been more naturally disposed.

Almost any practitioner can recall just such cases that have come under his own observation, and it means that the man who had charge of the case had not received the training necessary to enable him to do his work properly. Much more might be said bearing on this point, but this is sufficient for the present.

Your attention is called to the ease with which blocks can be made for filling in spaces where two or more teeth have been lost and a large amount of absorption of the alveolar border has taken place. Such cases do not look well if plain teeth are ground in to fill the space, allowing the alveolar portion of the tooth to rest against the gum, and if pink rubber is used it presents an unsightly contrast with the natural tissues.

It is an easy matter to arrange and articulate plain teeth to suit the case, and then bake a gum on them; thereby forming a block that will in many cases deceive the most careful observer.

An operator possessing ingenuity and skill can modify this work so as to cover many difficult and otherwise tedious cases, and with results that will prove gratifying to both patient and operator.

This paper has been presented to you to-night with the hope of encouraging those who are not already in the ranks of porcelain workers, to take up the study and experimentation of it.

There can be but one result if those who undertake it will follow it with a determination to succeed and that is, a broadening and rounding out of the individual in every way. The manipulative skill is increased, and by the cultivation and development of the artistic sense which porcelain dental art particularly calls for, all other operations that the dentist is called upon to perform must necessarily receive the benefit of the increased development, and the man who has undertaken the work cannot but feel that neither the time nor the money spent in acquiring the knowledge has been misspent, for with the increased skill comes a recompense that is always proportionate to one's ability.

TO WHAT EXTENT IS THE WASHING OF AMALGAM MASSES AN IMPORTANT FEATURE IN THE PRODUCTION OF A GOOD FILLING?

BY DR. T. W. PRICHETT, WHITEHALL, ILL.

This proposition emanates from the American Dental Association to the different dental societies, with the request that they give it consideration and make a report of their conclusions.

In the light of recent revelations made by Dr. Black, it would seem to be a needless task to discuss the proposition at all. He quite clearly demonstrates that the implied meaning of the question has no basis of support—is supererogatory—obsolete. I quote

* Read before the Illinois State Dental Society.

his vigorous Anglo-Saxon on this point: "Washing processes with the view of restoring the alloy by removal of the oxide have as yet been but partially tried. The usual methods of washing with ether or alcohol proved to be of no value, though apparently much oxide was removed." If we accept Dr. Black's determinations as conclusive, that the best results only can be obtained by the use of perfectly clean alloys, as well as of their approximate proportions, then we have removed from our way a great obstacle to the securing of more constant results in their use.

Anything that will materially increase the efficiency of the alloys will be hailed with delight by a large number of the profession. That Dr. Black has pointed the way to methods that if well followed out make possible a very great improvement in the results of amalgam fillings, I do not in the least doubt. I like to say this of him in his presence—not waiting until his obituary shall be written saying of him, "he was a good man."

Since it has been demonstrated that freshly cut or strictly nonoxidized alloy makes the most stable and desirable amalgam filling, the wonder is that some one had not made so simple a discovery long ago. Heretofore two ideas seem to have been in the minds of many of the profession in regard to the effect of washing, or an attempt in some way to remove the oxidation.

Some would wash with the view that the mass when freed from oxide, would measurably prevent discoloration of the filling and of the tooth also. Others would wash with the expectation that the stability of *form* of the filling would be the better for so doing.

I will now put in evidence late testimony of one of our most experienced and methodical operators: "I have kept the records," he says, "as to washing of amalgams, but so far have had nothing to indicate definite results."

"Perhaps if the different cases were followed up closely something might be developed. As I see them afterward, the washed looks no different from the unwashed amalgam."

"Theoretically, it should be the proper thing to wash the alloy fillings—the purer the metals the better the amalgamation (one would think) and the better the resultant plug."

Practically, in the mouth I see no difference that can be with certainty attributed to the washing or nonwashing of the alloy."

"I have tried all the standard methods—have used acidu-

lated water—also at one time experimented with a solution of nitrate of mercury (which some one suggested would render amalgamation more perfect) with no results, so far as my observation went, which of course was very likely not as close as it should have been.”

“It simply shows, however, that so far as my experiments and practice went, the results were not striking enough to enable me to see any difference.”

The conclusions of our friend are about the same, I imagine, as most of us entertain upon this subject.

The gist of the proposition is—“the production of a *good* filling.” Then is not the question pertinent—what *is* essential to the to the production of a *good alloy filling*?

Out from among us I hope to hear a familiar voice declare that it is largely a matter of the “personal equation” that contains the elements that makes the answer in its most definite, complete and comprehensible expression.

NOTE BY DR. BLACK.—By arrangement made by the Committee on Program with Dr. Black and a number of the members of the society a number of experimental amalgam fillings were made in steel tubes on the afternoon of the first day. Measurements of shrinkage and expansion of these fillings were made by the use of the amalgam micrometer by Dr. Black, and by the microscope by Dr. F. B. Noyes, and the shrinkage and expansion reported in detail on the third day. These tubes with the amalgam fillings, together with the instruments and plans of measurement, were exhibited at the clinics on the second and third day.

The results of these experiments strongly exhibited the fact that many of the alloys being depended upon for filling teeth by members of this society are at the time of their use in such condition that they will shrink badly; and further, that up to the present time no available means have been developed by which the dentist may safely know of the good or bad condition of the alloy he may choose for use.

It is believed that the publication at this time of the results attained in detail would do injustice to some good alloys, specimens of which were shown by the experimental work to be in bad condition, without being able to point out, in the present state of knowledge of the subject, a safe and efficient remedy.

The general subject and the particular experimental fillings

were freely discussed by the membership, and the progress made in the study of the nature and causes of the deterioration of cut alloys noted.

REPORT OF THE SUPERVISOR OF CLINICS.*

By J. W. CORMANY, M. D., MT. CARROLL, ILL.

Dr. J. W. Wassall, of Chicago. Apparatus for compressed air at the operating chair. The supply of air is derived from any source, and led to the rear of the chair; likewise, the electricity for the air warming handpiece. The air is used from two silk covered tubes and handpieces, which when not in use hang on the back of the chair, one for cold and one for warm air. The cold air handpiece is a simple, hard rubber affair, with a metallic nozzle and a revolving, graduated valve. The tube for the air warming handpiece contains conducting wires for the electrical current. The valve of the handpiece controls both the air and the electricity with one movement. The air is warmed by the nozzle, which terminates as a coil of platinum wire imbedded in porcelain through which a very small current of electricity only is required to be passed. The value of the handpiece lies in the fact that the air is given the required temperature at its very point of delivery.

Dr. A. W. McCandless, of Chicago. Demonstrating use of No. 60 fellowship foil. The advantage claimed being that a filling made of this foil is not so apt to pit as a filling made of No. 4 folded to 32 or any other thickness, because one weld will make a more perfect filling than where eight are made on a piece of gold of equal thickness.

Dr. W. H. Taggart, of Chicago. An accurate process for fitting bands to badly decayed roots. After the root has been ground to the gum line, or beneath it if necessary to get a good, definite outline, and the root trimmed, an impression is taken with a ball of pink gutta-percha, slightly warmed but rather resisting in order to push the gum away. This impression is imbedded in plaster, and while this is yet plastic a small rubber tube is placed over the gutta-percha, and as soon as the plaster has hardened pour into this tube Melott's metal directly onto the gutta-percha impression. This metal die is then trimmed with a coarse saw and enamel chisels so as to have parallel sides. The band is then fitted to this finished metal root, and is absolutely accurate.

* Read before the Illinois State Dental Society.

Dr. A. H. Peck, of Chicago. Case was a porcelain faced bicuspid crown. Band 22 k. gold, 28 gauge ; backing pure gold, 36 gauge, using an Ash tooth for the facing ; 20 k. solder was used for the band and the occlusal surface. The attachment of the backing to the facing, the attachment of the post and the attachment of the facing to the shell were all done at one soldering, a platinum wire having been twisted about the parts to hold the facing and the band in proper relation the one to the other. The only point the clinician wishes to bring out in this piece of work is the fact that all the soldering can be done with no investment at all, and without the aid of the blowpipe ; only the flame of a Bunsen burner being used. The doctor has soldered all cases of this kind in just this manner for the past two years, and as yet has had no failures.

Dr. E. M. Robbins, of Carthage. Large crown cavity in second lower molar, right side, filled with No. 4 soft gold and No. 3 tin foil. Main body filled with gold and tin and finished with cohesive gold.

Dr. J. H. Prothero, of Chicago. Preparation and filling of a proximal incisor "step cavity." Name of patient, Chas. Brown. Left superior central incisor, cavity on distal surface. Step was cut on lingual aspect of tooth two-thirds across the incisal edge, disto-mesially. Base of cavity was flat, and at right angles to long axis of tooth, with two triangular retainers. Step was also flat, and at right angles to long axis of tooth, made at the expense of lingual plate ; but the labial plate was cut slightly and beveled toward lingual surface. Retention by slight groove in base of step. Cavity was filled with Pack's cylinders No. 4 semicohesive condensed with a hand mallet manipulated by operator.

Dr. J. E. Keefe, of Chicago. Patient, Chas. Brown, colored. Cataphoresis ; twelve minutes' duration ; 30 per cent aqueous solution cocaine. Result, complete anæsthesia. Cavity, upper left central incisor, posterior proximal step cavity, filled by Dr. Prothero.

Dr. A. W. Harlan, of Chicago. Pyorrhœa alveolaris. Dr. Harlan treated five cases, the first being incipient pyorrhœa. After the removal of all deposits with instruments sterilized in boric acid, saturated solution, the case was injected with an emulsion as follows :

Alumnol.....	gr. v.
Resorcin.....	gr. v.
Oil gaultheria..	min. i.
Water, minims.....	ad. q. s. m. c. x.

This is used once in three days.

Case. 2. This case involved three inferior incisors, two molars and one bicuspid. After the surgical treatment a 2 per cent solution of trichloracetic acid was injected into all the pockets, to be followed in three days with the first prescription for a period of about twenty to thirty days, every third day.

Case 3. Inferior third and inferior second molar. As the gums were sensitive, chloral-camphor was used as an anæsthetic. When the surgical work was done—and having been done painlessly—the pouches were injected with sulpho-carbolate of zinc, 5 per cent solution, to be repeated in three days.

Case 4. Superior molar without antagonist. Anæsthesia was induced locally with chloral-camphor, and the pockets treated with acid trichloracetic, 2½ per cent in water.

Case 5. Superior lateral incisor and cuspid, with a pouch on the lingual aspect of the incisor and one on the mesial surface of the cuspid. In three minutes anæsthesia was induced with chloral-camphor, and all deposits having been removed, the pockets were injected with acid trichloracetic 5 per cent.

Dr. Harlan used platinum and gold needles for injecting pyorrhœa pockets. They are brought to a red heat in a spirit flame before being used under the gums in every case. When teeth need ligating for a time pure silver suture wire is used, as the pathogenic bacteria will not grow on a silver plate. (See Johns Hopkins Hospital reports.) When teeth are to be banded he prefers silver bands to either gold or platinum. He demonstrated that concentrated lactic acid has no solvent effect on either salivary or serumal calculus. It does have such an effect, however, in weak solutions, ½, 1, 2, 3, 4, 5 and up to about 11 per cent; after that its action is very slow. Dr. Harlan exhibited a gold crown set with gutta-percha dissolved in carbon disulphide. The solution should be very thick, and the bulk of the crown must first be filled with gutta-percha, slightly warmed.

Dr. Arthur G. Smith, of Peoria. Patient, F. W. Conkey, of this society, Homer, Ill. Condition was a missing second bicuspid on the right side of superior maxilla. The adjoining first bicuspid

and first molar being very solid and strong teeth, perfectly sound with the exception of a small amalgam filling in the distal surface of the bicuspid. Had time permitted, I should have preferred to replace this amalgam with gold before inserting the bridge. The tooth used was an ordinary plate facing backed in the usual way and soldered to an iridium platinum wire which had been previously bent and fitted into slots in the two adjoining teeth. The work was set first in cement and then further strengthened by building over the anchorage wires with cohesive gold. This operation is designed to meet that class of cases where one or two teeth are missing, and where it is desirable to replace them without displaying any gold or destroying the pulp in the teeth used for anchorage.

Dr. B. Newsome, of Minonk. Selected upper left central incisor root. Prepared the root, made Pt. cap to fit the end of the root, using Pt. 30 G. for the band and Pt. about 35 or 36 G. to cover the end of the root, using pure gold as solder. Then fitted a post of iridio Pt. passing it through the cap (which is in position on the root) and into the pulp canal. Then selected porcelain facing ground to fit, waxed to position with post and cap in place. Removed all together intact from the root; invested in silex and plaster; when set, removed wax, attached pins of the facing to the post, also cap to the post, by soldering with pure gold. Removed all from the investment; ground the pins and post down until they could be easily covered with the body. Finished by filling in and contouring with Downie body and baking in Downie furnace.

Dr. Garrett Newkirk, of Chicago. Clinic on the forming and tempering of instruments, using therefor broken and discarded points such as accumulate in every dental office. The tempering was done by immersion of the points, heated to a bright cherry red, in ice water. He also exhibited various forms of scalers, chisels and excavators, made by Drs. Mariner, Cushing and himself. A principal feature in the shaping was that of the double curve or bend, by which the cutting edge is brought as nearly as practicable in line with the handle of the instrument.

Dr. Geo. J. Dennis, of Chicago. Fused a Rose mineral compound for a gum section of three teeth, using the Custer electric furnace. Time thirty minutes.

Dr. A. S. Waltz, of Decatur. Subject, Dr. Conkey, Homer,

Ill. Used tin foil No. 3, and No. 4 gold foil "Williams' untrimmed," equal parts combined, in right inferior second molar crown cavity.

Dr. W. V-B. Ames, of Chicago. Vulcanite plates with flexible rubber edges for securing better atmospheric retention. Pack flasks in usual way with ordinary vulcanizable rubber, using draughtsman's tracing cloth between the halves of the flask to permit separation. When the mold is accurately filled with the ordinary rubber, as much of this is trimmed away with scissors as it is desired to replace with the flexible plate rubber, Dougherty's or its equivalent, this packed and pressed to place and the case vulcanized for three hours or more. For upper plates the edge in the palatal region can be just back of the rugæ, leaving the palate uncovered. The flexible edge on uppers needs to extend only from a point back of the buccinator muscle on one side across the palatal region to the same point on the opposite side. For lower dentures the flexible edge must constitute the entire periphery of the plate. Samples shown show atmospheric retention impossible to secure by plates made of hard rubber entirely. The model should be trimmed according to best judgment of operator, where flexible rubber is attached.

Dr. John G. Harper, of St. Louis. Aluminoid. Aluminoid is a combination of rubber cement, any rubber dissolved in commercial chloroform, and aluminum powder. It is used to line the palatine surface of rubber plates.

To make. Dissolve rubber (such as we are furnished for vulcanizing) in commercial chloroform, it should be of about the consistency of thick molasses, incorporate with this about twice its bulk of aluminum powder; mix well. This gives you aluminoid. Invest wax upper plate in usual way, open and remove wax.

To use. Coat your model with liquid collodion and apply the aluminoid, which should be thinned with chloroform so that it will flow nicely, like paint; give four coats, allowing five minutes for each coat to dry; allow ten minutes or more for the last coat to dry. The case being packed, close and vulcanize; finish with brush and pumice, ending with chalk. The collodion and aluminoid are applied with camel's hair brushes. The aluminum powder can be procured from dealers in art supplies. The cost is small, requires but little time to apply, and adds much to appearance and comfort of plate.

A case was also exhibited of a girl of sixteen in whose mouth about ten of the deciduous teeth were still present.

The case of Dr. A. J. Curry, of Streator, was also exhibited. Dr. Louis Ottofy, of Chicago, implanted the right upper central incisor in November, 1887. The tooth is in perfect condition.

DISCUSSION ON DR. WASSALL'S CLINIC.

Dr. GILMER: Do you use the same means to turn on the air that you do to turn on the current of electricity?

Dr. WASSALL: Yes.

Dr. GILMER: I did not notice how you regulated the degree of heat. It seems to me it would want to be regulated.

Dr. WASSALL: There is a rheostat on the wall and the current of electricity is regulated by that. The force of air is regulated by a valve.

Dr. CUSHING: The report does not state how the heating point is made, does it?

Dr. WASSALL: The nozzle of the hand-piece or the point is a porcelain tube with a coiled platinum wire embedded in it. The idea of having a nozzle of this kind arose from the fact that every other syringe made for electrical warming air had the coiled platinum situated an inch or two from the point of egress from the syringe, and the air was usually cold by the time it was delivered, unless the coil was heated red or white hot which finally heated the whole syringe uncomfortably. This instrument is the outgrowth of conversations I had with Dr. Cushing some seven or eight years ago. We discussed these objections and determined to make use of the principle used in electrical cooking apparatus. We decided that they could be overcome by a tube of porcelain which should be warmed by electrically heated wire imbedded in its walls.

Dr. W. A. JOHNSTON: There is only one fault that I can find with the apparatus of Dr. Wassall, namely, that we cannot get it. He made this one himself and I understand it is not manufactured anywhere. If some one could be persuaded to put it on the market it would be a good thing for all of us. I have been trying to get such an apparatus, but find it is out of reach. I feel satisfied that if it were put on the market it would be a popular thing.

Dr. W. H. TAGGART: I have one criticism to offer on Dr. Wassall's apparatus. I am not satisfied in regard to the heat-

ing of it. My idea is that he does not get the full and satisfactory effects of compressed air from the apparatus that he uses, for the simple reason that he does not use a sufficient quantity of the air. He tells me that he does not use it in the trimming of roots of teeth for making crowns. If there is any place where compressed air is of decided benefit, it is there. When the blood commences to flow (the stream of compressed air going at a pressure of from twenty to thirty pounds), if the nozzle is sufficiently large, the air will blow away the blood and serum and blow back the flap of gum so completely that the root can be seen in its entire circumference. You can see down the side of the root wherever the gum has been stripped back. It goes down as though it were an invisible tool and presses the gum away with absolutely no interference from the blood. There may be blood on the mouth mirror, but the root is absolutely free from blood or anything to interfere with a direct view. With a larger stream of air, and with this given pressure of twenty-five to thirty pounds, it is an excellent thing for pushing the flabby gum back around the root of the tooth when examining it. In nearly every case I have been able to see spiculæ of bone that I could not feel with an instrument. In passing the instrument down to take off angular corners, or to remove pieces of tartar, unless we get proper hold of it with a crooked instrument, the instrument will slide over it as though it was tooth substance. The compressed air blows the gum back so thoroughly that we can see along the root of a tooth and see black spots of serual calculus. I think high pressure and large volume of air yields us the greatest benefit.

Dr. WASSALL (closing the discussion): Perhaps a word or two are required in the way of explanation. The one application that I showed to-day was the use of compressed air for a chip-blower and it was not intended to cover all of the uses to which it can be applied. In order to see the deposits in a pyorrhœa pocket use the Roentgen ray. I find it very much better.

DR. ROBBINS' CLINIC.

Dr. ROBBINS: I am always ready and willing to stand by a friend, and tin and gold combined is a filling material I have always considered a friend as well as a benefactor to my patients.

Tin and gold have redeeming features that can only be appreciated by those using them. You will have less cause for amal-

gam tests, as well as less use for amalgam after becoming accustomed to the use of tin and gold.

While I am not averse to the use of amalgam, still I use but very little of it.

I always keep tin and gold prepared in my cabinet and can fill an ordinary cavity with it in less time than it will take to prepare the amalgam and have a better filling when done. I would say this to those who wish to try it, that in making your filling, if you wish to change from tin and gold to gold, do not anneal the gold until you have the surface of the combined materials well covered with unannealed gold. If you do you will work up a crumbly surface on the tin and gold, which will cause your filling to part at that point.

Dr. O. M. DAYMUDE: How about the serrations of the instruments?

Dr. ROBBINS: I use instruments of deep serrations until finishing or until I commence using annealed gold, but would caution against condensing to the point when the plugger will cut the surface. Be sure to get the material placed well against the walls, and always keep the center of the filling a little in advance of the margin; always placing your material so as to wedge into place. If shallow serrated instruments are used you are liable to soon have a surface so dense as to prevent wedging of your filling.

Dr. SITHERWOOD: Would Dr. Robbins use tin and gold in the beginning of a large proximal filling in a bicuspid tooth?

Dr. ROBBINS: Yes, if the tooth was not so badly decayed that I would have to restore the contour.

Dr. SITHERWOOD: I filled teeth with tin and gold in proximal cavities of bicuspid teeth years ago, but I have not filled any in recent years. I do not like to have a patient return to me asking the cause of the blue line or discoloration.

Dr. ROBBINS: I do not wish to be understood to say to use tin and gold instead of gold, but rather it than the indiscriminate use of amalgam.

DR. HARLAN'S CLINIC.

Dr. BROPHY: There is one thing that Dr. Harlan should explain, and that is the use of silver wire. I have heard him explain the advantages of it, and I think he would make that interesting if he were to say a few words.

Dr. ROHLAND: I would like Dr. Harlan also to speak of lactic acid and to explain the use of it. It has been substituted for sulphuric acid. We would like to know something about the use of lactic acid and the disadvantages, if any, of it.

Dr. HARLAN: I exhibited a tooth that had been taken from the mouth, which had on its various surfaces, crown and root, both salivary and serumal calculus. This tooth was placed in concentrated lactic acid before the audience at the beginning of this clinic. Some time later (two hours), the lactic acid was washed off, after which it was dried and submitted to those who were around the chair to show that concentrated lactic acid had no effect in a short time on either salivary or serumal calculus; but just as soon as you dilute it with water 1-10, 1-4, 1-3, with 2 or 3, 4 or 5, up to 11 per cent, it acts with more or less rapidity. After it gets above 11 per cent, it does not act with any great facility, and when it is concentrated it does not act at all because I have left teeth in it forty-eight and ninety-six hours without any softening.

Speaking of deposits on the teeth without the addition of any water, this was Merck's concentrated lactic acid.

With reference to the use of silver, in the Johns Hopkins Hospital reports for last year there will be found a reference to the cultivation of various pathogenic bacteria, which I believe is also referred to by MacFarland in his work on bacteria. The bacteria will not grow on silver plate. As soon as I learned that definitely I commenced to ligate teeth with silver suture wire. I had used it a good many times before, but not with any definite therapeutic or beneficial effect. I found in those cases where I made figure of eight loops and doubled them, fastened the ends well, that it would stay on for two or three months before it would be corroded. A gentleman in the *Dental Register* quite recently states that he has found in cases of pyorrhœa alveolaris, that in fitting a silver band around the neck of a tooth right away the tooth commenced to get better. The idea is that by using silver bands and soldering them together, driving them well down on the tooth so as to get them as close to the edge of the gum as possible without irritation in connection with the local treatment, the cases get along extremely well. So I think that perhaps from the fact these various pathogenic microorganisms will not grow on silver, we have a mechanical therapeutic agent which will be of great value.

The other points of the clinic—I do not know that there is any

necessity for discussing them—but I think it may be of interest to you to know that concentrated lactic acid injected into a pyorrhœa pocket will not dissolve the concretion on the root, and that the silver used as a ligature or as bands may give you great benefit.

With reference to chloral-camphor it is a well-known pharmaceutical product. You will find it in all your text-books, and although some of you know a good deal about it, you have not utilized it. There are many times when you do not wish to use cocaine solutions or other drugs that are likely to be poisonous, and you will find that if you take a pair of pointed pliers and dip it in a solution of chloral-camphor, passing it gently around the root of a tooth which is free from blood and saliva, as well as you can in a short time, an operation that is usually very painful would in some cases become entirely painless, in others almost so, and you have not a bad smelling drug in the mouth.

Dr. NEWKIRK: Speaking of the use of lactic acid, is it not diluted to a sufficient extent before use?

Dr. HARLAN: Coming in contact with the exudation does not dilute it the same as water does.

Dr. ROHLAND: Does it act on the tooth?

Dr. HARLAN: In this situation you make it act on the tooth deleteriously but until it is sufficiently well diluted it has no power to act on the tooth.

Dr. CUSHING: Does it act out of the mouth when it is diluted?

Dr. HARLAN: Yes.

Dr. NEWKIRK: Is it not always diluted from its practical use in the mouth?

Dr. HARLAN: Not in the same way it is with water.

Dr. CUSHING: You have not much doubt it will act upon the teeth?

Dr. HARLAN: No.

Dr. BLACK: Camphor was so extremely obnoxious to me that I have refused to use it. My patients speak likewise.

Dr. CORMANY: The camphor taste predominates.

Dr. BLACK: One word in regard to lactic acid, I have used it to separate the enamel rods and I have found it a very effective agent for that purpose. I can get good separation of the enamel rods by its use. I have used Merck's lactic acid, but I do not add water to it. I could not say it had taken up water. Lactic acid acts on the enamel, but not rapidly. It takes a great deal longer

to get good separation of the enamel rods with lactic acid than it does with a 2 per cent solution of hydrochloric acid. I have also used it for etching enamel sections that have been cut for microscopical examination, etching out the remaining substance from between the rods in order to show the enamel rods well. It does that very nicely. So I would throw out that much of a warning as to the use of lactic acid in the mouth, saying at the same time that its action is slow.

Dr. HARLAN : It was not my purpose to recommend lactic acid, but simply to disprove a very general statement that has gone through dental practice that it does remove the deposits from the roots of teeth in the concentrated form, but just as soon as you inject a $\frac{1}{2}$ per cent solution of it, or drop a tooth in $\frac{1}{2}$ per cent solution it attacks it with great avidity.

Dr. KOCH : Attacks what ?

Dr. HARLAN : It attacks the concretion, the enamel, dentine, etc., but if it is to be used for injection into a pyorrhœa pocket for the purpose of clearing up any remnant of salivary, serumal, or sanguinary calculus which may be adherent to the root or crown, it does not do it. As soon as it comes in contact with albuminous matter it forms a coagulum, and then it ceases to be diluted quickly and in a short time a drop injected in such a situation is neutralized or rendered inert, so to speak. I do not want you to use lactic acid ; I do not think it is a good thing. I do not recommend it. I made that demonstration simply to show that it did not possess the properties that had been claimed for it.

Dr. C. R. TAYLOR : In reference to hydrate of chloral and camphor I have used it in my office for twenty years, and there are numerous cases where the hydrate of chloral and camphor, equal parts, rubbed and made in the form of a solution, can be advantageously used for extracting roots, or lancing abscesses, or it may be used in very severe cases of toothache. When you have tried everything else and failed you can often get results from this preparation that you could not obtain with anything else in toothache. It is a great anæsthetic and anodyne as well as soporific.

Dr. G. D. SITHERWOOD : I would ask Dr. Harlan if he uses trichloracetic acid simply as an escharotic in the treatment of those cases that he mentioned.

Dr. HARLAN : A 2 per cent solution of trichloracetic acid is not a powerful escharotic. I use it for the purpose of acting as a stimulant and astringent and as a possible germicide.

If you will recall some recent literature on the subject of acetic acid, you will find that in the Johns Hopkins hospital reports that a 7 per cent solution of acetic acid was found to be more powerful than one to one thousand solution of bichloride of mercury. The addition of three parts of chlorine in the preparation of acetic acid does not render it less active as a germicide and destroyer of low forms of animal life, and consequently it may be considered in one sense a caustic. It may be used in full strength, or in 50, 40 or 30 per cent solution, or even less. One gentleman here, Dr. Dunn, has frequently used it in the mouth, as I have myself in so-called canker sore of the mouth with great benefit. A solution between 5 and 10 per cent is quite strong enough, and you will find it acts admirably. It is a powerful constringer and it will dissolve the calculus on the root of a tooth. Any one of you can drop a tooth in a 3 per cent solution and in two or three hours it will be so softened that with your fingers or thumb nail you can push it away, and it crumbles and disintegrates. If you are going to use an acid to assist you in removing deposits which you have failed to remove, trichloroacetic acid seems preferable to any of those that I have used.

Dr. SITHERWOOD : I am glad to hear Dr. Harlan say that because it corresponds with my own experience.

DR. ARTHUR G. SMITH'S CLINIC.

Dr. G. V. BLACK : I feel like saying a word about this bridge. I have put in a number of bridges practically in that way, except the beginning of the filling is made with gold. Having fitted the supports as well as possible by building up carefully and forming to them as well as I can, trying my bridge in place occasionally until I get it to lie firmly, some annealed blocks are laid on, not condensed, the bridge laid on that and the gold condensed under it by malleting upon the wire laid in the slot. The slot is broad enough to condense the next gold and weld it to that beneath, and then completing the filling over the wires that lie in the slot. It is a good many years since I made my first bridge in this way, and a number of the patients who wore these bridges are dead and have taken them to their graves with them. They have done very well. The caution I would urge from my own experience is to make the supports sufficiently strong to bear the force of mastication. I have had a few of these bend so that the tooth was out of position

but still doing good service. I know of no one of these bridges that has actually failed. But I do think it is an error, although much easier to do, to put cement under these supports.

Dr. CORMANY: I would suggest that the wire should be square.

Dr. BLACK: And I would suggest still further that it be three cornered with one of the flat sides resting on the support.

Dr. CORMANY: That is right.

DR. NEWKIRK'S CLINIC.

Dr. E. H. ALLEN: I think some mention ought to be made of the instruments exhibited by Dr. Newkirk. He himself called my attention to the fact that they were made by Dr. Frank Mariner. They are beautiful and delicate instruments.

ILLINOIS STATE DENTAL SOCIETY.

DISCUSSIONS ON PAPERS READ AT THE ANNUAL MEETING.

PRESIDENT'S ADDRESS (SEE PAGE 387).

Dr. C. N. JOHNSON: The president kindly requested me this morning to open the discussion on his address, and to criticise him if I found anything with which to disagree. I am glad he has given me that privilege, because I have found something to criticise. He made one reference, however, that I am glad to commend, namely, in regard to the late Mr. Bingham, and I simply desire to corroborate to-day what has been said and written about that noble man. But as to this immortal, imperishable, eternal question of colleges, I have just a word to say. I suppose I am entirely too sensitive about the criticism that has been heaped upon colleges. But I believe a man should be privileged to be sensitive who spends winter after winter in directing the best energies that lie in him to advance the curriculum of dental teaching. I notice now, as I have noticed in the past, that in the discussion of this subject, the men who know the most about dental colleges are those who have never had anything to do with them. It would be a matter of wonder if our colleges developing as rapidly as they have in the United States, did not make mistakes. But I am not here to defend the mistakes of our colleges. I am here to say that the work the colleges are doing to-day for the benefit of the pro-

fession is ignored by a large number of men, and the men who are on the outside have little conception of the energy necessary in college teaching. I refer those men to the kind of students turned out to-day as compared with those turned out twenty years ago. Let them see the two classes operate and they will see the difference. Gentlemen we are making some progress and I do not believe the colleges should be criticised all the time. If they make mistakes, and they probably do, they should of course be corrected, but the wholesale condemnation we so often hear tends to no good.

As to the number of students graduated, probably too many men are coming into the profession, and yet the public do not get the proper dental service that they require. The main point in connection with this matter is to educate the public up to an appreciation of dental services, then there will be work for all of those dentists who are reputable practitioners.

Dr. Stevens touched on one subject with which I am quite in accord, although I do not want to seem to agree with him entirely because he would not like that. He spoke of the preliminary requirements. I think that these in the colleges of the United States should be raised. One college of itself cannot do it, but they should all combine to do it. In this connection there is another side to the question. I used to be more rabid than I am to-day over preliminary requirements for young men entering our dental colleges. I have had considerable experience in this regard, and I have often found that the young men who came with their certificates and diplomas from academies, did not turn out to be any better dentists than others who came without diplomas. It requires something more than a college education to make a good dentist. While I am strongly in favor of raising the general standard of dental education, at the same time I want to say that there are a great many men who to-day are famous in the profession, and who have reflected the highest credit upon it, but who if such requirements had been exacted at the time they entered the profession, would have been kept out of it, and we would have lost them. There is one eminent man sitting in this room to-day, who told me a few years ago that if these preliminary requirements had been enforced when he became a student, he never would have been a dentist, simply for the reason that he could not live up to them. This of course is not a conducive argument in favor of admitting

men who are not well educated. But the dental colleges are not always to blame for the admission of students who are not educated. I presume the president of this society, if he were at the head of a dental college, would accept an applicant for admission to the college, provided he furnished a second grade teacher's certificate. I know of an instance not long ago where a man seeking admission to one of our dental colleges, presented such a certificate. Later on, in writing his college examination he spelled the word senior "cenior." He always wrote the first personal pronoun with a small letter, and his general composition showed a corresponding deficiency.

In some matters the dental colleges are helpless, but it is undoubtedly true that improvements shall be made in our matriculation methods.

As to lengthening the period of instruction, I believe that a four years' course is none too long. We must eventually come to that. We cannot take the rough timber we sometimes get, and mind you, when I make that statement, I do not necessarily mean the men who are uneducated, for some of the educated men who seek admission to our college are the roughest timber we get, so far as making good dentists of them is concerned, and in three years qualify them to go out and do justice to the public. A four years' course is therefore essential.

The matter of having an examining board to examine students that enter the profession, is an old subject. It has been threshed over time and again, but I will say that if we are going to place this matter in the hands of State boards, we must have good boards and must give them the implements of war with which to do their work properly. I say this in no spirit of criticism of any State board we have had in Illinois. The State examinations have been sadly deficient, but not by reason of any fault of the board. They have arisen out of the peculiar circumstances existing. Some of them have simply been a farce. It is impossible to judge from the methods used in the examinations whether men were qualified to practice dentistry or not. I should be glad indeed to see the State board have the regulation of this matter, but they must be given the necessary funds with which to conduct proper examinations.

Dr. B. J. CIGRAND: I have only a few remarks to make on this subject, and I agree with Dr. Johnson with reference to what he has said regarding our dental colleges, that the good ones frequently

receive the blame which should be heaped upon the poor ones. The profession do not frequent our colleges as much as they should in order to see and acquaint themselves as to how the work is done. That there should be a reform in some respects in our dental colleges there is no question. I believe one reform can be brought about by an examining board for matriculation. I believe that each college in the State ought to have certain members of the faculty to represent it on a board for examining students for matriculation, and all students wishing to matriculate in any dental college in the State should be required to appear before such a board. They should be examined on the various subjects outlined by the National Board of Dental Faculties. After the applicant passes this board he should receive a certificate permitting him or her to enter any college in the State. As it is now the applicant goes to one college, and after having gone through a rigid examination in physics, mathematics and the other prescribed branches, and fails to matriculate, he simply goes to the next college, likely on the opposite corner, and after a routine examination he matriculates there. The result is the good school helps to hold up the standard, but the poor school does not get the blame for it. There should be an investigation into this matter.

I know that this undesirable condition of things exists from experience. If the Illinois State Dental Society would discuss this matter at some length and arrive at some definite conclusions, I believe that as a body of dentists it would do the dental institutions a great deal of good. This board to which I have referred should have the power to determine who shall and who shall not matriculate. This is the great question. We must establish a high fence for our preliminary requirements. I would suggest that those students coming from the country or city with a good preliminary knowledge, possessing degrees, or who have had a good English training, should be exempt from examinations in the freshmen course, that their attendance upon 80 per cent of the lectures should be considered sufficient. Any man who has a good college training, who has merited the degree of A. M. or Ph. D., or any of the degrees equivalent to these, is sufficiently trained and learned to get the salient points of lectures without having to go through an examination. If students were thus solicited and such encouragement were given a betterment in the condition of our colleges would certainly result. I believe that reform is to come

about in that line. The whole thing in my estimation sums itself up in a board to examine applicants. When that particular point has been settled, I believe the grievances now before the dental profession will have been agreeably adjusted.

I am in favor of lengthening the course and of making it more rigid in every detail whether it benefits the colleges in a financial sense or not ; this society could do a great work in aiding the reputable colleges in establishing a curriculum which would in many particulars reflect credit upon our profession. I am most decidedly in favor of raising the standard of dentistry and know of no safer method of procedure than to inaugurate a more universally rigid course in our dental schools, but this hoped for end cannot be attained under present existing circumstances unless a board of probation such as I have outlined be in force. With this board we could hope for better and brighter matriculants and more dignified graduates. If a college cannot live by having good men enter, it had better fall by the way and die.

Dr. E. K. BLAIR : I would like to know of Dr. Johnson what effort the colleges are making with regard to the matter of low prices for dental services. There seems to be a class of practitioners coming into the profession with the idea that the first thing necessary to secure business is to reduce the prices. I would like to ask, if it is in order, what the colleges are doing toward impressing upon the minds of students the necessity of receiving ample pay for services rendered to patients. Students should be taught that it is not right to reduce prices in order to secure business.

Dr. C. N. JOHNSON : Since that question has been asked I will say that it is a matter of ethics, and I do not know of a dental college in which ethics are not taught. So far as answering the question of Dr. Blair in detail is concerned, I cannot do better than refer him to a lecture which I delivered to a class of students on this subject this winter. It was published in the March number of the DENTAL REVIEW. I stated there my ideas in reference to this matter.

Dr. E. K. BLAIR : It seems to me that our colleges need to do more work in the direction I have indicated. It makes a deep impression upon the mind of the student. The tendency in some localities to do dental work at reduced rates is ruinous to a great many practitioners.

Dr. C. R. E. KOCH : I am in love with the dental college professors ; I am in love with the dental profession ; I am in love with the people and with the subject under discussion. I apprehend that all of this discussion and hackneyed talk is very largely due to the want of a correct understanding of each other, and not to a real difference of opinion on the main question. I think all of us, whether we have been to college or not, have sufficient intelligence to know that it is desirable to get the profession on the highest possible plane attainable at this day, and I was very glad to hear the Governor say something that I have myself said several times before : " That a profession is judged by its best men, but the aim and great consideration for a profession's work should be to raise, to elevate the lower stratum as near to the top as possible," and I hope that those of us who have any influence with the Governor will see that when the next legislature meets he will use his executive power to help us to the attainment of that end. (Applause). Gentlemen, it is unnecessary to cast inuendoes upon honestly conducted dental schools, upon faithful workers in the dental schools. We all recognize them, and whatever is said in criticism is never said in criticism of these men, but upon conditions which we and they should labor to change.

The question Dr. Cigrand raises presents a dilemma. He would have a board of examiners for matriculants composed of representatives of the colleges. That is all right if colleges A, B and C come in and live up to their agreement, but the plan is impracticable, as D, E and F may not. Whatever we do let us aim to obtain practical results. If we lay aside personal pet theories for awhile and compromise upon the attainment of practical results for the benefit of the people, and incidentally of the profession, we will get as near to getting the right thing as possible. What I would wish the Governor to do is to recommend that a law be passed, or the present law so amended that no man hereafter shall enter the practice of dentistry in this State until he presents a diploma from a dental college. Mind you, I do not say *reputable*, for I do not care whether the college is reputable or not. You cannot make it reputable. The question of reputability is a moral one and the judge who sits upon it may have a more or less moral bias, consequently you cannot get a judgment that will stand in all cases. What we ought to have in the interests of the people and consequently of the profession is this, that no one shall enter the

dental profession hereafter excepting he presents the diploma of a college that shall require not less than three calendar years of instruction before granting such diploma, (if you wish to raise it to four years I am willing) or who presents a license of any foreign country or State in the union, showing that he has been in practice for ten years previously. Then all men possessing these qualifications shall go before a board created by the majesty and might of the State of Illinois and have the value of their credentials passed upon by personal examination before a license to practice in our State is given them.

Dr. Johnson raised an excellent point which those of us who have had the misfortune of serving on a board know how to appreciate. Give us a law that shall require a large enough fee for these examinations and confirmation of the diploma and you will have a revenue to make these examinations what they ought to be. In addition to that the law should provide in very plain language for inflicting punishment upon transgressors. It ought not require the action of a grand jury to find an indictment before an offender can be brought to trial. The simple establishment of a fact should be proof for conviction in any court of justice, and the necessary indemnity should be enforced. If we can unite on this line without collegiate or other jealousies, we can carry the fight. We can hold the Governor to what he said. He will have to join us.

Dr. Stevens raised one other point. He spoke of a national board. A national board would be an unconstitutional body. There is no such thing attainable because the constitution of the United States reserves to all the different States the right to make their own police regulations. If the State of Illinois would take this step it would not be long before other States of the union, that have not already reached it, would join and we would have practically a national law. We should have comity between the States. There are a number of older practitioners all over the country who never enjoyed the privileges of obtaining a dental education the same as the young men of the present day do. It would be manifestly unjust to debar them from coming to the State of Illinois if they can show that they have practiced elsewhere under authority. If the law requires a diploma from an efficient dental college, and accepts nothing else, we would bar out nearly all those ladies and gentlemen

men who may have gained their knowledge in foreign countries, because in those countries, as I understand it, there is no such thing as a dental college as it is known in the United States. The foreign "diplomas" that it has been my privilege to see were no more than a mere statement of the fact that A or B had appeared before the duly organized board provided by law and has given satisfactory evidence of his ability to practice dentistry. This is almost the exact wording of the licenses used by the several State boards in our States, and it would be a manifest injustice to have them recognized as diplomas when coming from foreign countries, and issuing licenses to the holders to practice their profession here; whereas the practitioner from Iowa or Wisconsin coming to Illinois with such a certificate is told that it is not good. The official certification should be given standing and recognition. We ought to make the thing as easy as possible of accomplishment for the prospective practitioner with all due safeguards to the interests of the people. That dental colleges have made mistakes is no reflection upon them or their teachers. It is the fault of our system, of our law of incorporation. Just as quick as a State board has its local colleges all brought into line to comply with the requirements of the State, some new college bobs up, secures a charter for \$2.50, and the whole work has to be done over again. The question of reputability of colleges should not be left to the board, simply require the production of a diploma after a certain established standard of tuition and make everybody that comes be treated alike, and I think we will solve the entire question, and I feel that if all of those within the radius of my voice would go to work as missionaries to this end, we can get such a law through at the next session of the legislature.

Dr. A. W. HARLAN: One phase of the president's address, which was really intended to be more or less of a disparagement of the dental profession as compared with others, is a high compliment, and that is this: In the statement of the number of matriculants and graduates in schools of theology and law and medicine, the highest number of graduates in the arts and sciences only reached forty-four for theology, and theological schools have been in existence for thousands of years. Schools of law have been in existence for more than one thousand years, and yet only 34 per cent of the graduates in the whole United States are graduates in

letters. Medicine has been taught systematically for more than 500 years, and in a fragmentary way for nearly 2,000 years, and still the number of graduates in arts and sciences coming from the schools in 1893 and 1894 is only a fraction more than 23 per cent. The organized dental profession of the world does not go back sixty years and in that time we have nearly 7 per cent of the total number of graduates who possess degrees in arts and sciences, and more than 50 per cent of them are graduates of high schools or academies. This is extremely complimentary to a profession so young and so recently organized. (Applause.) It is easy enough to talk and to criticise the actions of men and corporations, but where are the reformers? Who are the men who lift up their hands and voices to stamp out abuses in professions as well as in civilized communities? They are very few. It is less than fifteen years ago that any one could enter a dental college in these United States and graduate after attendance upon one term. For the past two years the requirement has been three consecutive terms before a student could come up for graduation. I would like to ask you, Mr. President, and members of the society, whether it was the members of societies that inaugurated this step, or whether it was not through the influence of State Boards of Examiners and the coöperation of dental college faculties that brought this about. Every year the members of dental societies get up and criticise and talk, insinuate and blow away the whole fabric of education, but it lives and thrives. It grows stronger and broader, takes in more subjects, teaches men to have a better education. The question of ethics, considered so lightly by some, will settle itself. It reminds me of what the governor said in his remarks a little while ago that a profession is judged by the best men in it. If the energies and efforts of the best men be directed toward lifting a profession up, all of the stragglers in the rear ranks will be gradually elevated too. I believe we are growing faster every year than any of the other professions. I think that the time perhaps has not yet arrived when a four-year course should be compulsory. That would prove something of a hardship to those 7 or 8 per cent of graduates in the arts as well as sciences. Why a man possessing a degree lower than that of a high school diploma should have the right in a professional school to sit by the side of one who has a B. A. or Ph. D., or some other title, showing that he has passed through a certain course of study I do not know. It seems to me

to be an injustice to such a man who is well trained and has honestly earned his diploma. When a man has obtained his diploma he ought to have the same rights and privileges accorded to him for the amount of information which permitted him to gain that badge. So I think the colleges can do very well by insisting upon a three years' course, and with the aid of boards of examiners, if they will only keep up to that standard, we will get along fast enough, and when we are a hundred years old we will be able to show at least 20 per cent who are possessed of degrees in letters or science. I trust the proportion will be greater than that when we celebrate our centennial.

Dr. J. G. REID: Reference has been made by Dr. Johnson to the question of ethics and the regulation of fees for dental services. When the people are fully educated to an appreciation of what a professional man ought to get for a certain class of work, they will pay it. It is a slow way of reaching the masses, but it is sure. They will arrive there some time in the next hundred years, that is, there will be a gradual progress in that direction. I feel that the question propounded by Dr. Blair was in a measure very pertinent. It was reasonable, and in certain localities he undoubtedly knows of cases where prices have been considerably reduced, and which doubtless prompted him to ask the question. I will state that when a student leaves his alma mater, he is rarely qualified to conduct a business on business principles. He may know probably how to treat the diseases incident to his profession; he may know how to handle the mouth from a mechanical standpoint well, but he does not have the slightest idea how to conduct his profession on a business basis. He is entirely ignorant of it. We are asked almost every day throughout the college year by students these questions: "How do you do so and so, and how much do you charge for so and so? What would you charge for this, and what would you charge for that?" We teach them in a measure the value of the service. When they leave college they have not the slightest idea how to charge. They have not been in practice a sufficient length of time to determine what the service is worth. They act upon the principle that they must do the work cheaply in order to get business. It seems to me there should be a business training in the dental college, as well as the theoretical and professional training. The business training is just as im-

portant as the knowledge required to practice. Dental institutions are lax in imparting that information. I have had more or less experience with college work for years and I know that this is one step which is neglected. I believe if students were taught how to properly charge for services rendered, it would be an advance.

Dr. GARRETT NEWKIRK: I did not intend to say anything on this subject, but it seems to me that we get into practically the same groove every year. We have the same tirade by somebody against the dental colleges, dental professors, present systems, and in fact everything in general, usually by men who have not done very much themselves personally for the advancement of the profession. (Laughter.) One great mistake is that we take too narrow a view. We look a little at this thing or that, instead of looking over a long period of time and seeing what progress has been actually made. There are men here who remember something about the progress which medicine has made in the last thirty years. When I was a boy a man could leave his blacksmith shop in the morning without one single idea of physiology, anatomy, or materia medica, could have a sign painted "Dr. Jim Smith," and have it hung out before night. There was nothing to prevent it except the man's own conscience, and the sense of the community, both of which were often wanting. In short, there was nothing to prevent any man from starting as a doctor of medicine. I can remember that well and my hair is not very gray. Then came medical colleges, one after another, with all their imperfections; they had plenty of them, but on the whole they were organized, superintended and managed by men who had the interests of the profession at heart; men like Daniel Brainard, J. W. Freer, N. S. Davis, of Chicago, and many others, east and west. These men had the interests of their profession at heart, gave their best energies to its advancement, raised the standard of education, and instead of graduating students at the end of one or two years, as had been done, they increased the course to three years, and now it is four and five years; and to-day, through the collective energies and ambition of the best men of the profession, American medicine stands in an exalted position before the world. These things are matters of evolution. They start from small beginnings and grow. It has been the way of education in all departments, from the common schools to our colleges and academies; and it has been the same with dentistry. We can all remember, even the

youngest of us, the great advancement that has been made in dental education. We know that the standard of dentistry to-day is incomparably greater than it was twenty or thirty years ago. We are on the up-grade. We are climbing higher, but we are not doing it by the stimulus of mere fault finding, insinuation and blowing, as Dr. Harlan has intimated. We are doing it by the honest steady purpose of the men who are engaged in the work. We have just about reached the point where we ought to have a good law in the State of Illinois, and Illinois is generally the banner State. If we can secure such a law as we desire some other States will fall in line and the future will be glorious.

Dr. GEO. D. SITHERWOOD: I live in the central part of the State. I am connected with no dental college, but occasionally look in upon some of the best dental schools in this country and I wish to bear my testimony to the marked improvement that has taken place within the last fifteen years in the matter of equipment and facilities for turning out better students. I have had the pleasure of meeting many of the students who have graduated from our dental colleges, and I am assured that these men know how to practice dentistry a great deal better than did those of many years ago. I am sure that this society is doing all it can toward elevating the profession. The one thing I wish more particularly to emphasize is, that it should be our aim to send the dental colleges better material in order to have more competent dentists. By doing this they will some day become useful members of this and other societies.

Dr. E. K. BLAIR: I trust the members of the society will understand that when I spoke of teaching ethics and of maintaining prices for our services, I did so in good faith, and I want to say that there is no one more in accord with the colleges, when their work is well done, than myself. I believe the wholesome growth of our profession largely rests with the colleges. Fortunately I meet college professors a good deal, and I am sorry that I do not meet more of them.

In the executive council meeting this morning, when it became positively known to me that we had almost 2,000 practitioners of dentistry in the State of Illinois, and the society had only a membership of 165, I said that there was something radically wrong in the present condition of things in the State of Illinois, or else this society would have a larger membership. Just what it is I do not

know. This society has exerted a good influence for years, and yet our newspapers throughout the State are full of advertisements. When I asked Dr. Johnson a question, I thought the colleges might stem the current as it was running in the wrong direction. I feel that this is the place for us to post ourselves in regard to these matters and I know of no one better qualified to answer these questions than Dr. Johnson. I trust the colleges will go on with their good work. Just in proportion to the output of the colleges will be the character and growth of dental education. That is what we want and must have. When we consider that we have only 165 members in our society, with 1,600 or 1,800 dentists to pull it down, there is abundant room for the strong arms of the dental colleges of to-day. Some impression must be made upon students. They must be taught to build up and not to pull down. It is important to the people of the State inasmuch as they come to us to have work done. The young man, who in starting out to practice dentistry works for small fees, makes a mistake. It will have its effect upon him and eventually drag him down. It is injurious to the people who seek his services and we all feel the effects of it. The colleges should take the initiative in this work. It is my desire to uphold the colleges.

I have had young men come to me who desired to fit themselves for the practice of dentistry, and realizing that they had not the ability to follow the profession with success, I have frankly told them so. I have this ambition, that when I send or recommend a student to a dental college and he graduates therefrom, I want him to reflect credit upon the man who sent him there. Let us therefore help the colleges, if possible, by furnishing them better material. Let us do something to stop the downward current.

Dr. E. D. SWAIN: I think the time has come for short speeches in this discussion. I am not in the habit of making long speeches, and consequently I have but a few words to say. It is apparent to me that Dr. Stevens wrote his address with the idea of drawing out discussion, and I think he has succeeded most admirably. Of course, from the position which I occupy, I am compelled to say that I believe the dental colleges are doing what they can to elevate the profession. The point I wish to make is that no profession can grow alone. We must have the influence of the community. All educational institutions are trying to grow in the same direction, upward, and so long as we have some of the coun-

ties of the States of Illinois, Indiana or Ohio boards of education, that are putting teachers certificates upon the market for so much money, the dental profession cannot grow, nor can any other professional organization. I know this is being done, and I hope the men composing this society, when they go home to their respective counties, will investigate the matter a little. We accept students upon teacher's certificates. If an incompetent person pays five or ten dollars or even more, and brings a certificate to us, we ask no questions. We accept that student. If it is bogus the blame cannot be put at our door.

Dr. E. H. ALLEN : A thought has suggested itself to me by the discussion of this address, namely : I do not know that any dental college requires a preliminary examination in fitness relative to the mechanical ingenuity or genius, as you may call it, of the applicant for admission to a dental college. I do not care whether a man possesses the degree of Doctor of Philosophy, or Bachelor of Arts, if he has not the make up within him by which he can carry out the theories learned in a dental college, if he cannot carry out with the ends of his fingers what he is there taught, he is not fit to touch human teeth. I have a case in mind at present. The person is a graduate of one of the dental colleges not a thousand miles from here. He holds a diploma and is entitled to practice. I do not think it is the fault of the college entirely, but if the college required some preliminary requirement to find out whether this man was fit and had the ability to work with instruments upon teeth, they would soon find out whether he was a mechanic or not, and if he proved himself incompetent in this regard they should have rejected him on that ground. By so doing it would be better for the public at large. It seems to me we ought to have a law to protect the people from such incompetence. I do not know that any such requirement has been exacted by any dental college, and it seems to me it would be a good thing if it was.

Dr. STEVENS (closing) : I have very little to say. I desire, however, to correct some of the statements made by Dr. Harlan. He misunderstood the figures as given by me in my address. (Here Dr. Stevens again quoted from his address.)

In relation to dental colleges, you will notice that I said *most* of them, and not all of them, should be condemned when viewed from a financial basis or standing. I stated that the main require-

ment of the applicant for admission was his ability to pay \$100. I know of two applicants who went to a certain college and were rejected. They then sought admission to another school and were admitted. I do not know but that they have graduated as dentists.

Because a man has received a collegiate education does not make him a qualified man for the practice of dentistry. There are many college graduates who could not make a hoe handle even if they tried.

Dr. Black has been referred to as saying that if the standard of dentistry had been raised to the level that it is to-day when he began to practice, he would not have been able to enter the profession. He has been one of our most energetic students from early life, and many a man has been the same. Elihu Burritt was a blacksmith, and you are all more or less familiar with his history. His early career was very slow, but he would have made a reputation in almost any profession which he might have chosen. While he labored as a blacksmith he learned several languages. I know of a man who could not read his a, b, c, at the age of twenty-one, and yet within fifteen years he became the superintendent of public instruction for the State of Tennessee. Did that man remain idle and waste his time? Not at all. He sought every opportunity to educate himself.

Dr. JOHNSON: May I ask one question for information? Did you not refer, Dr. Stevens, in your remarks to Dr. Black?

Dr. STEVENS: Yes.

Dr. JOHNSON: The man to whom I had reference to in my previous remark was not Dr. Black. We have other eminent men in the State besides Dr. Black, and it was not Dr. Black whom I had in mind.

Dr. STEVENS: He to whom you referred deserves the same commendation as I gave Dr. Black.

DISCUSSION ON DR. CIGRAND'S PAPER (SEE PAGE 402).

Dr. J. W. WASSALL: I think in the main that the method of making crowns as described by the essayist, is capital, and while there are some valuable features connected with it, there is an element of weakness which endangers its permanency, namely, the use of vulcanite to connect a porcelain face to the cap. I have never made one, and I have never seen one, but we all know how

rubber deteriorates and sometimes shrinks, and the teeth seem to loosen in the vulcanite plate. I should think the small amount of rubber which is used between the cap and porcelain face would be an element of weakness. I have myself used a cap and porcelain face in connection with the Downie body, and also recently, since I have had the Custer furnace, with the close body. While I have had some break down with the Downie body, they did not do so with the close body. I do not see how a crown can last unless iridio-platinum is used in preference to platinum over the band. I should consider a band very faulty that was made with platinum alone. This has been verified by a few unfortunate cases where I used platinum before resorting to iridio-platinum.

I now use iridio-platinum entirely for the band over the cap and for the post. Platinum alone is too soft. Pure platinum is as soft as pure gold.

Dr. G. D. SITHERWOOD: I heartily agree with the statement of the essayist, that the time has arrived when we should try to imitate nature, as every artistic dentist does. We should strive to apply the form of construction which will give the best mechanical, and at the same time artistic results. The difficulty, I presume, with this kind of a crown, as I find with all porcelain crowns, is in getting the crown short enough. I have experienced considerable difficulty in that respect. I agree with Dr. Wassall in reference to the iridio-platinum band. I have made crowns of porcelain with Downie furnace, using a flat back cuspid and soldering with pin, letting the body run across and build up the inner cusp. A short and strong tooth is made in that way. I have had none of them break, and have been making them for two years.

My experience with the use of black rubber in such a small space as this, is that there is a tendency to form little bubbles, or to admit air, and there is not a perfect union of the materials. Vulcanized rubber in so small a quantity is not water tight, and I prefer the other method. The all porcelain cusp, using the platinum band, and building up under the cusp using the Downey furnace. I have not used the electric furnace. Short bicuspid crowns made in this manner will be strong and artistic.

Dr. W. V.-B. AMES: The paper read by Dr. Cigrand deserves commendation, inasmuch as the author starts out with the assertion, that it is desirable in this kind of work to secure more artistic effects than we usually see on the streets of our cities in

the way of conspicuous gold crowns. The paper covers a wide range in the matter of construction of these crowns. Personally, I should place very little reliance on rubber for this purpose. It seems to me it would take more time to invest and vulcanize a piece of this kind than it would to make one almost any other way. While I think these crowns may be very artistic when made, I should avoid the use of rubber.

Saddle back teeth I have used satisfactorily for crowns by backing up with gold and soldering to root cap. For six or seven years, ever since Ash & Sons have had a branch in America in fact, I have gotten much satisfaction from the use of the diatoric tooth for bicuspid crowns, where the length of bite will allow. A cap and pin fitted to the cervical end of such a porcelain tooth and soldered to the root cap, the porcelain tooth cemented to its cap with oxyphosphate or sulphate makes a substantial and artistic crown.

With high fusing bodies and the electric furnace we approach ideal results. I have had the same difficulty spoken of by Dr. Wassall, with the Downie body. If you have to heat this body several times in the completion of a crown there is great danger of the body first applied being injured by the later burnings.

Dr. W. H. TAGGART: I cannot commend the method which we have had outlined to us. In the first place, the title of the paper is against it—"A New Method." Among the very first methods for attaching and making artistic crowns was the use of porcelain teeth, attaching them to bands by rubber. It was not considered a very artistic way of doing it. The rubber did not prove sufficiently strong for the purpose, the title of the paper is, therefore, somewhat misleading.

There is another unfavorable feature about it. If we use porcelain for the articulation we must have porcelain in bulk. Porcelain, in order to stand the strain we require for this purpose must be used in bulk and not in thin layers. (Here Dr. Taggart illustrated the importance of this by diagrams on the blackboard). I have learned by experience that porcelain for grinding surfaces must be in bulk.

The method of making the cap as outlined by the author of the paper, in order to save some of the tooth substance, I should consider a disadvantage rather than an advantage if we are going to use a porcelain bicuspid, for the simple reason that it is difficult to make an irregular shaped band with the long part of the tooth

there (illustrating) and the narrow part there (illustrating). The difficulties of making this band more than outweigh the advantages gained.

Dr. Wassall spoke of iridio-platinum. There is an advantage in using it if you can make it fit, but by the time the iridio-platinum is thin enough to work well in order to enable us to adapt it to the root, the band which is not much stronger than a thicker piece of platinum would have been, and the platinum has a softness which readily makes it fit. The extra tightness of the fit adds additional strength to it, and it will outweigh any extra softness of the material. When the metal is in contact with the tooth substance, I have found no disadvantage in the softness of the platinum itself. For my own part I can see no disadvantage in the use of pure platinum in these cases. On the other hand I can see advantages in its favor.

Dr. J. G. REID: What is the objection to platinum showing on the lingual surface?

Dr. TAGGART: The more you are engaged in this work the more artistic you desire to be, providing you do not sacrifice strength. To attain this end, we must use a greater bulk of porcelain. To have as little metal showing as possible and to let that which is visible be porcelain develops one's ability along artistic lines.

Dr. G. D. SITHERWOOD: I was especially pleased with what Dr. Taggart said about these crowns. There is one point to which I desire to call attention. Sometimes a blue line appears at the margin after using platinum. I have overcome this defect by flowing a little pure gold foil over the band at that point, before I bake the porcelain. By doing this no blue line appears. This, however, will only protect in the low fusing body.

Dr. W. N. MORRISON, St. Louis: I desire to caution young men not to be heroic and cut down and destroy a better natural crown than the artificial one put in its place. While I like to see a porcelain face well adjusted, I think we ought to keep in mind the durability of the operation, which ought of itself to be paramount in the minds of our young men. For twenty-eight years I have given metal crowns a thorough test, and while they do not look well, I see many of them that have done such good service that many of the porcelain crowns, adjusted from a modern standpoint, cannot equal. Let us take one as a model in this figure (pointing

to a diagram). I regard it as a misfortune to cut away as much tooth substance as is here represented to make the foundation given below. There is just where the whole metal crown gives invaluable service. In submarine operations, such as we have represented here—there is not a good practical man in this house but knows the vulnerable point of submarine cement. Cases come to you time and again to have their crowns adjusted and recemented. There was too much heroic cutting upon the root in its preparation. I merely rise to caution the younger men to go slow, and to allow their æsthetic taste to be somewhat offended by the use of some good metal crown that will remain for twenty years.

Dr. CIGRAND (closing the discussion) : I shall only occupy the time of the society for a few minutes. In the first place, a good deal of the last discussion has been foreign to the subject ; notwithstanding, we have profited by it. The question was not relative to the anterior teeth, or the make of teeth that approximate the common Logan crown, but it involved bicuspid band-crowns with porcelain facings and cusps, and the method of their construction as given here is new. The question has been raised with regard to the platinum cap. I will say, in my case the cap was made of gold, No. 30 gauge. As to how far it shall be driven under the gums, I allowed as much of the tooth to remain as possible (Fig. 1), in order to secure anchorage for the gold cap. In other words, I followed the advice of Dr. Evans, of New York, who is a recognized authority on this subject, and he says that in all telescope work that we should leave as much of the original tooth structure as is possible for anchorage, and that we should not shove the cap up into the alveolar ridge. I trim it down as figure 2 shows.

With reference to the occlusion I will say, that when the cope is placed in position in the patient's mouth the occlusion is perfect, since the tooth is ground to fit the natural teeth.

The method of making crowns as outlined by Dr. Taggart looks very well on the blackboard, but when we come to do it in our everyday practice it is an entirely different picture that confronts us ; and for that reason the crown to which I have directed your attention, is more readily adaptable and adjustable, and proper occlusion positively attained. All the dental depots will supply you with saddle back teeth, and the new teeth which are being manufactured are less scalloped and present more body at the palatal cusp and are in consequence stronger.

As regards the weakness of the tooth at this point (the palatal cusp) mentioned by Dr. Wassall, I must confess that it is a weakness on the part of the artist rather than a weakness of the tooth itself. Is the strain any greater on these individual crowns than on some of the saddleback teeth in the vulcanite case?

SEVERAL VOICES : Yes.

Dr. CIGRAND: I do not think so, since the individual tooth yields, the other is firmly held in place by vulcanite. We are all entitled to our individual opinions. If there is any one thing that we should expect at this meeting it is just criticism. Your criticisms are of benefit to me as well as to others, and the man who is not able to stand criticism has no business in this society.

With reference to driving the band; I have no difficulty with the thickness of the gold I use. I prefer not to drive it too far through the gum margin. Dr. Brophy some years ago in a dental society made the remark that the hammer has no place in positioning crowns, its use being confined to the prosthetic laboratory; also, if he could not put on a telescope crown by the use of a stick and a little pressure, he would take the crown off and enlarge the band, thus avoiding any possibility of cracking the cope. There ought not to be too great a strain or hammer pressure brought to bear on the crown when it is being placed in position. If you do not desire the use of vulcanite, make the cope of platinum and fill the interspace with porcelain, as stated in my paper.

I thank you kindly for your criticisms, which I regard as just in many instances.

DISCUSSION ON DR. BENTLEY'S PAPER (SEE PAGE 412).

Dr. C. B. ROHLAND: It gives me pleasure to welcome among us a new writer. I believe Dr. Bentley is an acquisition that this society made only last year, and the talent displayed in this paper, if it be coupled with industry and the painstaking effort that the paper exhibits so effectively, it will undoubtedly make him a very valuable member.

The faculty of writing is of course a gift in many cases, at the same time, it is a talent that can be cultivated, and I trust that the new members we are taking in will do what they can toward cultivating the faculty of putting their thoughts on paper.

It is an education in itself, and if faithfully done it will be the

means of doing a good deal of good. For the benefit and encouragement of those who feel that they have no faculty in that way, I may say that he who is able to write the most glibly and the most easily is not always the one who will write the best papers. The one who has to work hard to put his thoughts on paper is very apt to give us a better digested and more valuable article than the one who writes easily. I say this for the encouragement of those who may think that they do not possess the faculty of writing.

Now as this paper is largely speculative, it would be hard to criticise its prophecies. It is always safe to look with confidence to the future for advancement and progress beyond normal expectation. The field of investigation that lies behind us is limited, that lying before us is boundless. It is never safe to say that the wildest and apparently the most absurd dreams and prophecies may not be fulfilled some time. Each new discovery opens up such vast vistas of possibilities that imagination usually runs riot as to the future. And who will undertake with certainty to sift the chaff from the wheat? When the Wizard of Menlo Park gave to the world a deeper insight into the characteristics of the electric current, and opened new channels for its application the public imagination was fired. How many seemingly absurd fancies have since been realized? At this very moment the world is in a fever of expectation over the vast possibilities just revealed of the cathode rays. The apparently impossible has so often been realized, that when a new epoch such as the present is made, there is a general attitude of eager expectancy, and the wildest dreams are listened to, at least, even if they are not accepted.

It would be rash, in view of all this, to say that hypnotism, to which the essayist looks forward with so much hope to assist us in alleviating suffering, will not in time become a valuable ally. Indeed I am quite willing to believe that its present limited sphere of usefulness will be extended. Bernheim, Charcot and others seem to have given us something tangible to work on, but practically the subject is still but little understood, and it is quite probable that the force we are dealing with may have within it some elements of danger. Experimentation along this line should proceed with caution. This is no field for reckless enthusiasm. The young practitioner, who still has his standing and reputation to establish, who still has to win the confidence of the public, not only in his skill, but his moral character as well, must remember

that there is a well-defined dread in the mind of the public of both hypnotism and hypnotist.

The essayist has made one statement that probably is more sweeping than he really intended, viz., that but few of our dental colleges give comparative anatomy a place in their curriculum. This is I should say hardly in accord with the facts. There may be a few who do not perhaps give it all the attention its importance merits, but I am quite sure it has a place in the curriculum of every reputable college. If the essayist means that the instruction in this branch should be more exhaustive, this proposition too will I think admit of question. It must be remembered that the time of a course of instruction is limited. Many branches must be covered. The student is simply put in the way to continue his studies. The college course is only the vestibule to the temple of knowledge. No branch can be pursued to its limit during an ordinary college course. That is a work of a lifetime.

The essayist expresses the belief that each public school will some day have its dental examiner. Theoretically it might be productive of much good to have periodical dental as well as medical examinations of the public school children, but there will be no harm in familiarizing the public with the idea. But public sentiment is a hard thing to control. The people are restive under any laws that they imagine have a tendency to interfere with liberty of action. The American mind does not take kindly to paternalism in government, even if it is clearly for its own good. Take a public, of whom perhaps less than one-tenth ever seek the advice of a dentist, and one can readily imagine what the effect would be were dental examiners installed in our public schools, and the children compelled to submit to examination, and if the teeth were found defective, compelled to have them repaired, before they were permitted to enter, for simple examination without being coupled with subsequent repair would do no good.

The attempt to incorporate such a provision into our laws would meet with failure, and under present conditions in my judgment, deservedly so.

• While I am on the floor, I wish to say a few words about the methods of conducting our discussions. I take it that the reason there is some member assigned to open the discussion on a paper is that he may have an opportunity of looking over the paper in advance, seizing its salient points a little better perhaps than could

be done while the paper is being read, and in that manner direct the discussion into better channels and keep it within bounds. This paper was handed to me yesterday, but was called before I had an opportunity to look it over, hence I have not given the subject that thought that I otherwise would have done and that its merit deserves. This set me to thinking, and I believe it would be well for us to have abstracts of all papers that are worth bringing before the society, incorporated in the programs that are sent out so that all members may have an opportunity of following the line of thought of the paper and the position taken by the writer. I think this would be the means of stimulating greater interest in the papers that are read. Very frequently a paper is announced by title, and we have very little idea of what its author is going to talk about. Indeed, it is simply guess work. Again, some of our members are not as good readers as the present essayist, so that it often is no easy matter to follow them. It seems to me it would be an excellent idea to have a short abstract of each paper distributed among the members with the programs before they come to the meeting, thus giving them an opportunity of noticing the line of thought to be treated. All of us would thus be better prepared to speak on the subjects that are discussed. Another point. Very many are not able to speak offhand or think they cannot, and so do not speak at all. If they could write out or think out their remarks beforehand many would be tempted to take part, who now only listen. These remarks may not be very pertinent to the subject of the essay perhaps, but I am quite sure if the suggestion were adopted, it would make another "new outlook" for the interest of our discussions.

Dr. NEWKIRK: I do not want the closing remarks of Dr. Rohland to pass without some criticism. I don't believe that his idea of furnishing abstracts of papers to be read to the different members beforehand is a good one. It is my opinion that half the interest in the papers would be lost. Supposing forty of our members should come with written subjects prepared from abstracts, where would our sessions run to? I think the spontaneity of the thing, the way a paper strikes when it is read, and the discussion it elicits at the time, are altogether better than a cut and dried arrangement, such as the doctor suggests.

Dr. E. NOYES: It is evident in my mind that Dr. Newkirk has not been chairman of the executive committee. He does not

seem to have any idea of the difficulty of getting forty men to write something for this society. It seems to me that the suggestion of Dr. Rohland is a good one, and that a knowledge beforehand of the subject matter to be discussed would promote the interest and value of our proceedings. The object of these meetings is to get a careful expression of the matured opinions of the largest possible number of men, and the only way that can be done is to contrive some plan of enabling our members to study beforehand what they are going to say, and I can think of no better way than the one suggested. It is a method in common use in a great many societies and is eminently practical. There is one other point that occurred to me, namely, that the discussion of papers in this society should be, and I suppose is understood to be, a discussion of the subject of the paper and not necessarily restricted to its subject matter; that is to say, if any one desires to get up and take an entirely different line of thought or outlook into the future of dentistry from what was taken in the paper it is a legitimate discussion of the subject.

Dr. A. W. HARLAN: I do not like to take up so much of the time of the society, but I think that it is only due to the author of the paper, who has spent some considerable time in its preparation, that the subject presented should be touched upon by some speaker on the floor.

In looking over this paper I notice that reference was made to some of the original work done by Dr. Black many years ago under the title of the "Formation of Poisons by Microorganisms," although it is not so stated. I go back farther than the author of the paper does, namely, to the beginning of serum therapy. The influence of that work on the development of the dental profession at large is just beginning to be felt. Before that time the little knowledge that we had with reference to the production of dental caries was comprised in the theory of Robertson, in the work of Leber and Rottenstein, and that of Magitot, and the theory of the late Dr. George Watt and some work of Underwood and Milles. Of course there may have been other theories with reference to the production of dental caries, but these were the principal ones. After the publication of Dr. Black's work on the "Formation of Poisons by Microorganisms," the experiments of Miller were presented to the world, in which it was clearly shown, or at least it so far has not been disproved, that dental caries was really the result

of the agency of microörganisms, and so from that time we have had a basis to rest upon. If Dr. Black had never done anything else in the world than to produce his little work on the "Formation of Poisons by Microörganisms," this society might well be proud of him. (Applause.)

One of the subjects touched upon by the essayist was a plea for the establishment of chairs in dental schools on comparative dental anatomy. In a few instances here and there lectures are delivered on comparative dental anatomy. The student has his zoölogy and comparative anatomy before he enters a school, and so unless the chairs are to be established for the purpose of instructing those who have not attended a high school, the absolute necessity of their being founded in dental schools is not apparent to me. Pretty soon all of our prospective graduates will be bachelors of philosophy, or bachelors of science, or doctors of philosophy, or bachelors of arts. When that time comes they will have had a good smattering of science before they enter our colleges.

Hypnotic suggestion was also spoken of as one of the new outlooks in dentistry. Somewhere during the reign of Louis XVI. or thereabouts, a gentleman by the name of Mesmer, of Paris, practiced hypnotism, not exactly on the scientific or medical lines that it is to-day. We are just beginning to feel that perhaps hypnotism might have a place in the practice of dentistry. I have not investigated the subject of hypnotism to that degree which would enable me to talk for or against its general use in therapeutics, but it seems to me that if it is to become a part of the armamentarium of the dental surgeon, that the dental schools should give a short course of lectures on this subject from a strictly scientific standpoint, according to the knowledge that we have of it at the present time. Then before dental societies we will not scoff at it, or turn our noses up at it, or say we do not believe in it, because what is known will have been presented to our students and they will have a correct understanding of it and will have read something about it, and then it can be considered properly. I presume that there are a great many persons who would be good subjects, but to advise the indiscriminate or the general practice of this agency in dentistry would be very injudicious. In France they have enacted laws to prevent the use of hypnotic suggestion except under what is called proper medical surveillance, and I think that until it begins to be a subject that is taught in our schools and colleges, the

societies will do well to read up on the subject from the present acknowledged authorities, such as Bernheim and men of his class.

Facial orthopedia. In this subject we have something that is practical. It is only within a very few years that any considerable attention has been paid to it, and I am very glad to say that men of talent and ingenuity are devoting themselves to this branch of mechanical surgery, which is certainly a great advance over the methods practiced up to a short period ago. I believe that Dr. Kingsley in his work on "Oral Deformities," denominates it a branch of mechanical surgery, and I think it is a good way of speaking of it. It is certainly in the hands of good men, such as Angle and Case, Jackson and Farrar, and some others. They are certainly doing great good in the way of improving the facial expression of the present generation throughout the world. I think one of the most interesting chapters in the transactions of the World's Columbian Dental Congress was that devoted to the pictures of appliances and the deformities by Drs. Case and Jackson. I have had my attention called to them very many times.

Going beyond the paper, are there not some other outlooks in dentistry that may be considered new? I was going outside of the points presented in the paper. The paper did speak something of prophylaxis in dentistry. Are we doing our whole duty as members of a branch of the healing art in prophylaxis or in preventive medicine. I enter the halls here from day to day and notice various exhibits of proprietary remedies and preparations, the exact composition of which we are thoroughly unacquainted. I say to myself, what are we doing. Is this in the line of preventive medicine? Can I prescribe something as a prophylactic when I do not know what it is? I should say that there was a large field for men in the compounding, the commingling, the gathering together of known substances in definite quantities that can be used for nasal, oral and pharyngeal prophylactic purposes. Nearly everywhere somebody gets up and says I do so and so. I use "jumboline," "tumboline," or some other thing, and he loses his absolute individuality in prescribing medicines, the composition of which he knows nothing.

Dr. C. P. PRUYN: The essayist quoted from some author, who says that pain is not a condition *per se*, but the mental perception of an injury. If we as dentists could apprehend and comprehend fully the meaning of these words and use the knowledge thus

gained in our practice, it would be of great benefit to our patients, pain not a condition *per se*, but the mental perception of an injury. That injury may be physical or mental. We might ask which is the greater suffering in life, physical or mental pain? Those who have suffered some severe mental anguish would say that mental pain is by far the most severe, no muscles or nerves being engaged to cause pain, but there was the mental perception of an injury. We have all experienced feelings of an injury at some time or other. We have been slighted or snubbed, as they say, and we have been greatly injured. Our appetite, our digestion has been interfered with for days or weeks, perhaps no physical injury, but the mental perception of an injury which was very severe indeed. If we can so understand this and convey it to the minds of our patients that pain is not a condition *per se*, but by using our mental power, making our mind stronger than the body, so that we may overcome our physical suffering, as we can to a large extent, we will be public benefactors to those who come to us for treatment. This can be done to a considerable extent. It does not require very much study, thought, or reading to help along on this line.

There is a grain of truth in Christian science, in faith cure, and in all of these fads that have been going through the world for the last ten or fifteen years. There may be a bushel of chaff to one grain of wheat, but we should throw away the chaff and take advantage of the wheat. If there is any good in it we should find it out and use it.

Suggestion is a force which practitioners can use in the treatment of disease. I think I may safely say that there has never been a successful practitioner of medicine from the earliest days to the present time who has not used suggestion as one of his strongest remedies. You use it every day without doubt in the treatment of your patients. You suggest to your patient that he or she is not going to be hurt by a certain operation. You instruct the patient to lay back and relax herself thoroughly, and if she does this the operation can be performed without much trouble. If the patient can place herself *en rapport* with the operator, the work can be done in an easy way and the patient will go away from the office materially benefited by the operation and very much refreshed. I consider that this is done in your offices every day in the week, mental suggestion. If we can suggest to the mind of our patient, why can we not also use auto-suggestion

ourselves for our own use and physical benefit. It can be done very satisfactorily. Sometimes our duties are so arduous that we become fatigued. Why not by auto-suggestion rest quietly, relax the parts thoroughly for two or three minutes during the middle of the day. Banish every thought of the work in hand from your mind. Instead of taking a nap of two or three hours, in a few minutes' time you can get a physical rejuvenation which would otherwise take three or four hours to produce. This is not something that is beyond the range of reason. It is being used by many men every day. It is simply common sense, I do not care whether you call it hypnotism or suggestion. I am using it, but I never suggest the term hypnotism to patients, simply because there is in the minds of many a prejudice against that term. If I use any term at all, it is suggestion, and it is and has been of great service to me.

Dr. J. W. CORMANY: While we are on the subject of hypnotism I am going to give my experience of it. While I was preparing a cavity for a patient and had nearly completed the work, I suggested that it would hurt a little, and as quick as a flash she flew up and said, "What did you tell me that for. You have not hurt me a particle up to this time." She was a Christian scientist and had hypnotized herself up to this time and I spoiled it all.

Dr. D. E. COULSON: I am not in the habit of making my voice heard in public, and this is my maiden effort, and I congratulate myself on the thought that I shall make it in discussing a paper which I consider ably written and grandly presented. I have been attending the meetings of this society for about fourteen years, and it seems to me it would be impossible for any one to attend these meetings without absorbing quite a good deal during that time. I believe that there is a mental law which requires the person to give off what he receives in order to remain in a healthy condition. I suppose that I was called on to participate in this discussion because I have been slightly interested in the subject of hypnotism. I have had a little experience with this agency, and I do not think I could do better than to tell you why I took up the study of it. In the first place, I have quite a number of patients who were Christian scientists. Some of them were mental scientists and I began to read along that line of literature. I got hold of one of the books written by Dr. Prentiss, of Chicago, who treats all manner of diseases through the eye, and we had persons from

our town who took treatment of him, gave a large fee and were satisfied. One man gave him \$500 and was never better satisfied in his life for the results he secured. And the subject presented itself to my mind in that way, and I thought that if all these isms are getting results, through what mediums are they securing them? And I have been able to satisfy myself partially by a study of mental laws. To what extent these will be applicable in dental operations I am not able to say, but that it has been a benefit to me I am absolutely certain.

The past history carries out the suggestion that nothing new is presented without opposition. I believe that in order to get the most out of life or out of the investigation of any subject we should allow that freedom which is frequently withheld. I do not know that my experience, or any part of it, would be interesting or profitable to you.

As far as hypnotism as a means of anæsthesia in dental practice is concerned—that is, perfect anæsthesia—I believe it to be a failure. I think the works on hypnotism only give us about 28 per cent of the subjects that may be hypnotized. But as an aid in allaying pain or dread, which is a very considerable factor in our work, I believe it is of great value.

Dr. NEWKIRK: Dr. Cormany's little story reminds me of an experience of my own, which fully convinced me of the value of faith cure, and power of the imagination. I had a patient two or three years ago, a lady who had made a study of this matter, and at the close of a series of operations she told me that she had been treating herself by faith cure, or mental processes, while the operations were going on; and that whereas she had formerly suffered a great deal, this time she had not suffered at all. I will say further for this lady that she is thoroughly consistent in her logic. She carries the application of her principles into business matters. She imagined she had suffered no pain; she also imagines now that her bill is paid. (Laughter.)

Dr. C. E. BENTLEY (closing): I do not know that there is very much for me to say other than to thank you for the complimentary manner in which you have received my paper, and also to apologize to Dr. Robland, who opened the discussion, for not having furnished him with an abstract of my paper in advance of the meeting. I think, however, the suggestion that he made is a good one. It would add interest and merit to the discussions, and in

my opinion would stimulate a great deal of thought that would otherwise not be brought out by virtue of the fact that one does not have an opportunity to prepare himself.

In reference to comparative dental anatomy in our schools, I want to say that I conceive it to be one of the basic principles that underlie the study of dentistry, not the comparative dental anatomy as is taught in the schools, as has been spoken of by the gentlemen who have preceded me, but comparative dental anatomy as it pertains to the evolution of teeth coming from lower animals and developing into the species, man. That is a broader thought than a mere technical study of comparative dental anatomy.

When we commence to understand that a possible explanation for dental irregularities lies in the study of comparative dental anatomy, we will begin to see the relativity and the practicability of the subject as it pertains to dentistry. When we consider the osseous deformities which have been called to our attention by criminologists, and whose investigations and experiments have recently contributed so much to our knowledge, particularly in the case of H. H. Holmes, we must confess that results have been startling along that line, and that it is possible for the osseous structure to be changed entirely by virtue of a mentality that has gone off in a degenerate direction. Such things are within the realms of possibilities of to-day, and we are standing upon the threshold of a new outlook in that particular direction. What is applicable to disease also applies to the osseous deformities of the teeth and their associated parts, the jaws. It is with this end in view that the teaching of comparative dental anatomy in our dental schools will be of consequence.

With reference to hypnotism the ground has been so thoroughly covered, that I shall have very little to say regarding it other than that the law cited in the paper and endorsed by Dr. Pruyn, if understood, means a great deal, and psychologists, men of science who experiment a good deal, tell us that pain is not a condition of itself, but is the mental perception of pain. That law has been demonstrated time and again in the army. Men engaged in war, have been shot through and through, and never knew they were hurt until their boots were filled with blood. The moment we perceive an injury, that moment we also perceive we have pain.

The word hypnotic has an odium attached to it that is in dis-

favor at present, but that should not deter us from looking into this question and getting the truth out of it. Hypnosis can be carried to the sleeping stage. Furthermore, it does not necessarily have to be carried to the sleeping stage, at which point it is equally as potent in the relief of pain. It has been my pleasure to keep at this subject, simply to see what is in it for the purpose of applying it to the patients who come to me for relief, and I have been astounded with the results that a novice can get in the treatment of some cases that have come to me. The fixation of attention is simply a suggestion to a patient, the extent of which can go so far as to relieve a patient of pain for the time being. That is mental suggestion. The word mental suggestion, or psycho-suggestion, which is a more scientific term than the word hypnosis or hypnotic, is induced by the operator to prevent the perception of pain.

I want to make this broad statement: There is not a man in this room who is considered a successful dentist in all that the word implies, who does not practice hypnosis, consciously or unconsciously, to a greater or lesser extent, and in proportion as you utilize this agency in your dental work, so will your practice materially enlarge. That may seem a wide statement, but it is my belief.

In reference to what has been said of Mesmer by Dr. Harlan, if I have the proper understanding, mesmerism or hypnotism are two different things, and they do not belong in the same category other than that possibly one may be a branch of the other.

This is a subject I ask you to look into, to read up, and I think it will be a profit to all of you if you so do. I thank you.

DISCUSSION ON DR. NEWKIRK'S PAPER (SEE PAGE 406).

Dr. C. N. JOHNSON: I am very glad indeed that a paper on this subject has been presented to this society by Dr. Newkirk.

As to Dr. Black's definition of shock; if shock is invariably sudden, then we have another condition quite as serious in its ultimate results and occurring more frequently in dental practice than in true shock, and that is the nervous depression, following protracted sittings, which possibly may not have entailed much pain. Patients will sometimes come to us and endure a sitting and leave the chair apparently in good condition, saying that the operation

has not been particularly painful. They will come back in a few days and inform you that after they had reached home they were very much depressed as a result of the operation. This depression does not come on suddenly, but it leaves a definite effect so far as the ultimate results are concerned.

Dr. Newkirk also says that collapse is not synonymous with shock; that it is a sequence of shock. If this be true, we must have collapse without symptoms of shock at all. We have this condition I referred to more than any other enumerated in the paper. The doctor spoke of cumulative shock, which I think explains the condition better than any other term. In this connection, as the essayist has truly said, dentists are in the habit of prolonging their operative work. Sometimes patients are unnecessarily subjected to long operations of great severity. I recall one instance where a lady went to a dentist, who is a brilliant operator, but who, unfortunately, has no consideration for the feelings of his patients. She had always submitted to dental operations without murmuring. She had perfect control of herself, and acquiesced in the judgment of her dentist. She was willing to stand any reasonable amount of severity and had really at times suffered much at the hands of this dentist. But this time she was in the chair a little longer than usual, the nervous equilibrium overbalanced and the result was collapse. She left his office apparently in good condition, but when on the street began to succumb. She went to a drug store, secured some brandy, and drank it as rapidly as she could and in considerable quantities, but it did not have any effect on her. She has never been the same woman since that operation and never expects to be. We should exercise some judgment and care and humanity in our operations instead of being invariably heroic. I believe in performing a permanent operation in every instance where we can do so with judgment. But if I were to select between a permanent and temporary operation, with the danger of causing my patient shock or any condition that would result in collapse from a permanent procedure, I should prefer some temporary means until the patient was in a better mental and physical condition to stand a permanent operation. I should study the characteristics and peculiarities of the patient in order to operate intelligently. If there is one thing I have to congratulate myself on in practice it is this, that I have never sinned extensively in that direction. I never give long sittings. I do not

believe it is very often necessary in the performance of the average dental operation to give a sitting longer than one hour. I have repeatedly made that statement and it has been considered a mistaken idea that we could put in the average filling in an hour. But I tell you I would rather concentrate my energies and pay particular attention to my operation, make every move count and expend more energy of my own to accomplish a given result in a short time than to keep a patient sitting in a chair two or three hours. The strain of sitting in the chair is very wearisome and trying to many patients, even when little pain is given.

Dr. G. V. BLACK: I have but a few words to say and most of them in reinforcement of what has been said. In reference to the terms collapse and shock, I will say that in capital surgery a distinction is scarcely made between them. They are used synonymously, and yet it is recognized that we have a character of shock which is not properly collapse, hence the term collapse is confined to the graver cases of shock, or the graver conditions occurring in shock. Cumulative shock is a good term, particularly in dentistry. Shock of the character that gathers force from time to time, or from hour to hour, is met with most in dentistry, and I fear very much that these forms of shock often pass unrecognized by the dentist. I presume my practice is a little bit different from that expressed by my friend, Dr. Johnson. When I have placed my patient confined to one position during an operation, I lose no time. For instance, I have prepared my cavity so far that I want my rubber dam on; I may give my patient some time before I put the rubber dam on; affording some relaxation from what I have been doing. But when I have put the rubber dam on every edge must cut until it comes off, and then my patient is relieved, is relaxed again. In this way we may carry out operations without great exhaustion, operations that would be very exhausting to patients if continuous. We may do a considerable part of the preparation of the cavity with the rubber dam off, giving the patient intervals of relaxation. Then, as I say, when we put on the rubber dam and confine the patient to a certain position, we should lose no time until we are through and take it off again, giving the patient relief and relaxation. Many dentists confine their patients to the chair too long and do great injury; also they neglect important advice to the patient after a necessarily tedious operation. Generally if we are observant about the condition of the patient

at the close of an operation, we will find that it is often of the utmost importance that she or he assume the recumbent position as soon as possible and retain it for a number of hours. Go immediately home and lie down, for it is in this position that in cases of minor shock the circulation will be most perfect and recovery the most prompt, and the patient will not suffer the next day or two from depression as she would do if she retained the upright position after the operation.

Again, in the matter of frequency of operations many of us are doing our patients harm. The average patient should not have a sitting more than once a week, and in the case of many patients the sittings should be divided as much as two weeks. I know there is some difficulty in carrying this out. I have to scold continually and put my patients off perpetually in order to do them justice, and in order that they may return to me in good condition for operation. It makes a world of difference whether a patient is in a bad or good condition when they go into the dental chair. It makes a difference to the patients themselves, and it certainly makes a difference both to the operator and in the operation itself. There is not a man in this room but what can make a better operation when he finds his patient in good condition than when he finds him practically unfit for an operation. So I would say, give your patient as much relaxation as you can during the progress of sittings; when they must be confined to certain positions, do your operations as quickly as possible. Do not make them very long. One filling at a sitting, as a general rule, should be sufficient, if not very large, and do not make your sittings too frequent. Extend them and your patients will not have such dread of operations as they do when you operate frequently.

Dr. C. R. TAYLOR: In my own experience I have found that certain persons were more susceptible to shock than others. There are certain conditions of the system that make it so. For instance, I have found young people and elderly people more subject to shock and nervous depression than any other class. I have also found that where persons have suffered from the formation of abscesses, that with a simple opening of the abscess the person will collapse and faint at once, and when they come to they will tell us that we have produced but very little pain, that it was not the pain at all that caused them to collapse or to faint, as we usually term it. There are certain persons who have some peculiarity of struc-

tures of either the body or mind, and we call these peculiarities, idiosyncrasies.

In connection with the remarks made by Dr. Newkirk, I will say that I know of one case where a professional friend of mine had a patient to whom he administered chloroform on a pledget of cotton by passing it into the mouth to wipe out a cavity, and before he succeeded in wiping out the cavity she received quite a shock. There was a jarring of the nervous system, a shock such as is produced from electricity. The woman swooned away and when she came to she said to her dentist that she forgot to tell him not to bring chloroform in her presence, for she had experienced the same thing once or twice before at the hands of her father who was a physician. A great many persons are peculiarly affected by camphor. Cocaine is another drug that has peculiar effect on certain patients. I had a patient not long ago from whose teeth I was removing tartar. The tissues were very tender, and I took a 2 per cent solution of cocaine, placed it on the gum, and almost as quick as I can snap my fingers, the woman swooned away. There was a shock produced to the nervous system. I had frequently used injections of the same per cent of cocaine almost indiscriminately, and had never found any bad effects from it.

The nature and extent of shock are largely dependent upon the condition of the general health of the patient. Again, there are certain operations which produce greater shock than others, such as scalds and bruises, but of course these come under the head of general surgery. As Dr. Black has said, long continued operations have a greater and more profound effect on the system than those of shorter duration, and spreading over a long time produce similar effects as do extensive injuries as in scalds and bruises.

A question I would like to ask here is this, Should an operation be continued while a patient is unconscious? Are we justified in finishing an operation under such circumstances? We have to contend with this occasionally, and it would seem to me that the best thing to do is to conclude the operation while the patient is unconscious unless unusually severe. If any of the members have had experience along this line, I would like them to discuss this point.

I had one patient who sustained a severe injury in a railroad accident. The whole superior maxillary bone was detached from the nasal process of the frontal bone to the posterior part of the

maxilla. It was broken in five pieces. The patient recovered from the operation which was performed, and in the sworn testimony in a court of justice in Chicago it was proven that the woman's entire nature was changed; that is to say, she originally had a sunny, bright, lively temperament, but now became morose and easily disturbed and looked on the gloomy side of life. The shock was so great that it evidently changed the molecular structure of her whole being. She was a beautiful woman before and that might have had some effect upon her life.

Dr. Newkirk paid Professor Black a high compliment by saying that he had written the best paper on this subject that he had read. I took the pains to look over several books, such as Agnew and Gross, and I am free to say that the best article on shock is by Dr. Black as given in the *American System of Dentistry*. Gross seemed to me to have two ideas in reference to shock. If a patient bled to death he would call it sanguinary shock, but Dr. Agnew came nearer to Dr. Black in giving us an explicit definition as to what shock really means. It is really a nervous condition produced on the system.

Dr. T. W. BROPHY: In classifying this matter of shock we must speak of it as being mental and physical, shock caused by an impression made upon the mind, or shock caused by physical suffering. Such a case as was related by Dr. Johnson was one of mental shock, but the suffering to which she was subjected caused the physical shock. Perhaps she may recover from the physical shock, but mental shock is oftentimes most difficult from which to recover. I could not take any exception to the term sanguinary shock, because shock not infrequently comes from hæmorrhage and collapse, the most difficult form of shock to control and to overcome.

Dr. Taylor put the question as to whether it would be justifiable to continue an operation when a patient was in an unconscious state from shock. That depends wholly upon the condition that we have before us. Were it a surgical operation and the patient became unconscious, I think in certain instances further operative procedure would be justifiable. Were the operation upon the teeth it might also be justifiable under certain circumstances. Were it an operation for the extraction of teeth and the patient became unconscious, possibly from the anæsthetic, or from collapse, further procedure might be the thing required to resusci-

tate the patient. I have known many a patient to be revived by continuing the operation.

As to the methods of overcoming physical shock the essayist said but little. It seems to me that no one should attempt difficult operations, especially in surgery, unless he has at his immediate command everything necessary to employ in case his patient is subject to shock, and whoever attempts an operation where the possibilities exist for shock, without having ready the means of resuscitating his patient, is taking chances that few men of experience and observation would approve of.

As to the best methods of resuscitating a patient who has sustained shock, I think the mental shock that dental patients often get is due in part to the attitude of the dentist. Some one here has said that the best course to pursue is to get the entire coöperation of the patient to allay his fear. Some member in speaking of the subject of hypnotic suggestion conveyed the idea that a certain influence was exerted by the dentist of which he was not conscious. But the effect was to quiet the patient and put him in that mental condition which would enable the operator to proceed with his work. We should endeavor to get the full confidence of a patient, have him coöperate with us, in order that we may do for him the best that we are capable of doing. That is the first thing. If you get your patient in that state of mind you are not going to have any mental shock.

As to physical shock, there is a strain, a nervous depression always following a dental operation of any considerable consequence. In opposition to that statement sometimes people may be put under the influence of an anæsthetic without any nervous disturbance, but these cases are not common. If we have a shock of this nature we may employ stimulants judiciously, conservatively, and relieve the patient and oftentimes enable him to stand an operation that would otherwise lead to a depressed condition of the nervous system. If it were an operation where the patient was in collapse, then we need to employ active remedies. I have had a number of patients collapse from surgical operations, one particularly last winter. A child a few months old, stopped breathing for seven minutes. This was a case of collapse from the effects of chloroform. It was really a shock. The nervous system was overpowered in part by the chloroform and in part by the operative procedure. The patient was literally dead ; the heart's

action ceased, and something had to be done. A prominent surgeon of the city was present, giving the chloroform and declared the child dead. Active measures were instituted to resuscitate the child. After the use of aromatic spirits of ammonia hypodermatically, and taking the child and inverting it, holding its heels up and head down and vigorously shaking it, the heart's action was reestablished and its life was saved. The use of brandy in case of shock, hypodermatically employed, should always be kept in mind. It is an easy matter to make use of the hypodermic syringe, inject brandy beneath the skin, assist the circulation, and thus promote nervous energy. We should get the nerves to perform their function, then by inverting the patient the blood is carried to the head and heart and the vital parts rendered active. The nervous centers must be supplied. The heart must be supplied. When the feet of the patient are down important organs are deprived of blood, and they therefore sustain greater shock.

There is so much to be said on the subject of shock that we have not sufficient time at our disposal to fully discuss it. Dr. Johnson said that there was not a subject, from a scientific standpoint, that was more productive and of more interest to the dentist than that of shock, because we are brought in contact with it all the time. Our own condition has a good deal to do with the patient. Let the dentist overtax or overwork himself and become nervous and attempt to do an operation for a nervous patient, it makes a bad combination. What he needs to do is to quiet his nerves and assure the patient that he is not going to be hurt as much as he anticipates. All of this contributes so much toward the prevention of shock. Our mission seems to be that of prevention. Accordingly the old adage, "An ounce of prevention is better than a pound of cure," is especially applicable when we come to the consideration of this subject of shock.

Dr. J.W. CORMANY: I do not want this subject of shock to pass by without calling attention to the fact that Drs. Johnson and Black alluded to the matter of short sittings. Short sittings are all very well for people in the city who are near the dentists, but short sittings for those people that drive twenty miles to see a dentist are out of the question. I have had patients come to my office who have driven forty miles, and if you tell such patients that they have been in the chair over an hour, and that if you continue any longer to operate upon them, they would be greatly

shocked, and I am satisfied that they would go to other dentists and have the remainder of the work done the same day. I do not claim that people in the country are superior to those in the city. Possibly they are stronger; they are in better health, and can stand dental operations better than the majority of city people can. I do not want the younger members to think that these suggestions apply to country patients. As a rule they do not. I had a young man in my chair not more than three weeks ago from nine o'clock until half past twelve, at the end of which time I said to him, "That is all I am going to do for you to-day." He replied, "Can't you do that other tooth to-day?" I told him I would do the remainder of the work some other time; that I was afraid of causing shock to myself and not to the patient. The people in the country, who come from a long distance to our offices to have work done, do not care to have short sittings. They want as much work done in a day as possible.

I agree with what has been said regarding the matter of having sittings as far apart as possible, say once a week, or once in ten days. I have tried this in the last three years and it works admirably with nervous people.

Dr. F. H. McINTOSH: I think the cases cited by Dr. Cormany may do very well occasionally, but I have patients, who suffer more from the anticipation of an operation than from the operation itself. They tell me this when I am through operating on them, and my method is not to tell them of the hour of sitting, but to inform them through their relatives the day before, when the hour of sitting is to be. This relieves them entirely of the anticipation of the dental chair. I think there is a great deal in the frequency of sittings. It is detrimental in some cases. The postponement of a sitting is detrimental also.

Dr. W. V.-B. AMES: I do not know much about shock except as I get it myself occasionally. But inasmuch as the trend has been largely toward the prevention of shock by the shortening of operations, I want to say something about the method I practice, but about which I must be a little cautious in stating to what extent I use it. I seldom make a large gold foil operation. I gave a clinic before this society last year, and I need not tell you that clinics are usually conducted under unfavorable conditions. My everyday practice consists of nine-tenths gold inlay work. I do not apply the rubber dam and keep it on for any great length of time

in this class of work—in fact, I do not apply it in one case in twenty for this kind of operation. I make my anchorage in a part of the tooth which is not sensitive and prepare the cavity by disks, well wetted, instead of using a bur in a dry cavity. I do not want to take the responsibility of recommending this to dental practitioners in general, but if there is any man here who has a taste for manipulating a soft pure gold plate and using the blowpipe in a delicate way, I feel like recommending this practice to him as a means of avoiding large operations which are bound to give shock to the patient, because in making inlay operations there is no time at which you cannot stop, put in a gutta-percha filling and have your patient come back when it is better for them.

Dr. GRAFTON MUNROE: I know very little regarding the theory of shock, but I realize from a practical standpoint what it is, and I desire to mention a case in this connection. A young lady was in my office a short time ago and after excavating a cavity, I found it was necessary to devitalize the nerve of the first superior right molar. She said she was feeling very well, and that I might go ahead and make the arsenical application. I had no sooner placed the arsenic on the exposure when I noticed that she was about to swoon away. My chair was placed in the reclining position and she was relieved. Before I reclined the chair I got the exposure sufficiently covered with cotton to keep the arsenic in place. She went home and told her sister, who was anticipating a dental operation, what had taken place, and her sister nearly swooned away at home. She has been trying to come to my office for a considerable time in order to have her teeth cared for, but the rehearsal of her sister's experience resulted in quite a shock to her. Six months previous she had been suffering from nervous prostration, and was seriously affected by this rehearsal. When my patient came the next time, three or four days after, she had me excavate and take the nerve out, and on examining the adjoining tooth I found that the distal surface of a second bicuspid showed an exposed nerve which I did not dare touch at the first sitting. She said, "You have not hurt me a bit to-day." I made an application of arsenic to the second tooth. I do not think it is a wise thing to make a long sitting for the first time. It is a good thing to change patients frequently, and I find it works admirably. I feel very much relieved myself when I have gotten off my hands the responsibility of one patient and have a fresh one to start on.

I feel refreshed myself. It is invigorating to change society. I feel as a young practitioner that it is a good thing to encourage short sittings and thus avoid shock.

Dr. NEWKIRK (closing the discussion): Dr. Johnson spoke of shock and collapse. I take it that whenever we make a distinct impression, as we do in any dental operation where we produce pain, there is apt to be a certain degree of shock. At every use of the bur, the excavator, or of the chisel, if there is a distinct impression made, it is shock so far. But as a rule this amounts to but little, and even that which I have called cumulative shock in the ordinary case is not serious. But when it goes beyond the powers of the system to react, in the exceptional cases, then we have collapse. Collapse is the *disaster*, the extreme result which follows upon shock, whether immediate or cumulative. That was the idea I intended to bring out.

Dr. PRICHETT: What is the difference between syncope and collapse?

Dr. NEWKIRK: I think practically there is very little difference as we ordinarily see it, though I presume there should be a distinction made. Syncope, faintness and unconsciousness are shock effects. To illustrate cumulative shock let me present an illustration. You know that among the tortures of the inquisition one among the worst consisted in placing the subject in a position where he could not move, where his head was held absolutely still, then letting successive drops of water fall with regularity upon the same spot. The drops of water for the first few minutes produced but trifling sensations, but in the course of hours they became worse than ten thousand deaths. It was cumulative shock. There is something like this in long continued dental operations. We know patients who endure well for a short time, but beyond that they cannot go without serious suffering.

A point I tried to emphasize, was the difference in cases. There is very little danger attached to the treatment of the majority of our patients. They stand operations well. They will probably stand more than an hour. In making those limitations of time I had reference especially to those who by reason of their condition of health, period of life, previous experience or temperament were *particularly susceptible*. These are the cases in which we should exercise extreme caution.

As to country patients, Dr. Black could give Dr. Cormany a

bit of history that would open his eyes, about a certain school teacher who was an invalid for years from just such prolonged operations as have been alluded to. Perhaps if Dr. Cormany should succeed in killing one or two, or ruining their health for life, he would take a different view of the question.

I was very glad that Dr. Black spoke so emphatically of the avoidance of frequent operations. In many cases his suggestion of one operation a week would be the one to carry out.

DISCUSSION ON DR. SCHUHMANN'S PAPER.

Dr. C. P. PRUYN : After having listened to such an exhaustive treatise on tumors of the mouth and jaws, and the nature of early diagnosis, it is almost unnecessary that anything further should be said ; indeed, there is not much more that can be said. Fortunately, or unfortunately, these tumors present themselves to the dentist comparatively seldom, so that there are many men practicing who have had very little experience in seeing and examining tumors of the mouth, while there are others who have had quite an extensive experience, and we all agree, I think, that an early diagnosis and prompt treatment, are imperatively required.

Most tumors that present to the average dentist are of the epulic character, which are so readily removed and treated. The operation for their removal is so simple that very little need to be said in regard to it. In the removal of these small growths with the finger nail, as has been suggested by the author of the paper, I think it could be better done by instruments, particularly with the cautery, which removes them very easily, and at the same time prevents hæmorrhage. The farther we become advanced in surgical knowledge, the more we will see of these growths without any doubt, and we should be sufficiently conversant with them to make an early diagnosis, whether we operate or not. The importance of an early diagnosis is apparent to all of us. For some reason the dental profession, as a profession, hesitate considerably with reference to performing surgical operations about the mouth and jaws. I do not think this should be so, for with our present methods of instruction and dispensary and hospital experience, we should be sufficiently conversant with these tumors in order to make an early diagnosis, and promptly treat them. I think it falls especially within our province as dentists to have this part

of surgery under our own domain to a considerable extent, and the chief reason why we have so little to do, is because we do not give this part of dentistry the attention we should. We become too much dental artisans, giving too much attention to the filling of teeth rather than to the surgical part, which is our work to do.

Dr. C. R. TAYLOR: I have had some experience in the removal of tumors of the mouth, and had I known the subject would have covered such a wide field as has been done, I should have been very glad to have brought along with me two or three casts of mouths, before and after the removal of tumors. One in particular—the case of a lady who had suffered several years from a tumor extending from the second bicuspid on the right to the second bicuspid on the left of the lower jaw. All the teeth in place. The method of removal of this tumor was by injecting it with a 95 per cent solution of carbolic acid, and the result was as complete and perfect as could possibly be obtained. It was a surprise to myself, I assure you. This tumor was removed in such a way that no signs were left of there ever having been anything of the kind.

I also resorted to the same treatment to remove an epulis, which had attached itself between a cuspid and a bicuspid tooth on the right superior maxilla, with complete success; but in that case I overreached myself a little by the method of injecting, and as a consequence destroyed a little more bone than I thought was necessary to accomplish the result. Septum between two teeth was removed by the death of the bone.

I have also had a few surgical removals of fibroids in the lower jaw, and just a short time ago I detached a very small papilloma from the soft palate. These were both done surgically. In twenty-three years' practice I have only seen two cases of cancer. One that came to me in the past year; a man eighty-five years of age; died in the hospital a few months afterward. In this case the cancer extended from the ramus to the cuspid tooth on the lower jaw. The second case was a man sixty-five years of age, who had a tumor in the antrum of Highmore. Fortunately cancers occur usually in very elderly people, whose span of life is nearly finished.

Dr. T. W. BROPHY: I regret that I was not here at the beginning of the reading of the paper. I presume, however, that Dr. Schuhmann gave good reason for his classification of tumors.

He said something, however, after I came in, in regard to the naming of tumors to which I would take exception, that is to say, I would scarcely agree with him in calling a cyst a tumor, and yet under the name of tumor we must express everything in the way of an enlargement, for the word tumor is derived from the Latin *teumeo*, signifying an enlargement. Anything that is an enlargement must necessarily be classed in the strictest acceptance of the term as a tumor. A cyst is not a tumor, because a tumor is necessarily a growth of tissue. According to the definition of the late William H. Van Buren, of New York, we have a striking analysis of what a tumor really is. Dr. Van Buren says that a tumor "is a local limited enlargement taking place in any part of the body and consisting in its substance of a new outgrowth of tissue, which has no physiological purpose." A cyst necessarily should not be included as a tumor according to this definition. An aneurism, while it presents an enlargement of the part, would not necessarily be a tumor; it would come more under the head of a cyst. So, then, a tumor I would take to be a growth of tissue such as we find in the simplest form as a wart. A wart is a tumor, a growth of the tissue, either of bone or any other tissue.

The field is too large to discuss in all its different bearings. We will take the form of tumor which presents itself most frequently to the dentist, which comes as a result of irritation. I refer to the epulic form of tumor, caused not infrequently by injudicious management of the teeth by the dentist, such as extreme force employed by quick wedging, setting up irritation of the pericementum and periosteum surrounding the alveolar processes, etc.

I differ with my friend Dr. Pruyn in the frequency of these conditions. I have seen a great many of them in the last few years. An irritation is established by deposits of salivary calculus and attempts are made to remove the calculus by instruments as in the treatment of pyorrhœa alveolaris. Of course, I agree that tumors are the outgrowth of the periosteum, and anything that will establish and keep up irritation of the periosteum is capable of causing an epulic tumor, or a growth from the periosteum. The application of a rubber dam, the ligating of it down close to the alveolar borders may be the cause of epulic growth. These growths are of the most common occurrence, and come more frequently under the observation of the dentist than any other class of oral tumors. They may be benign or malignant. There may be con-

ditions which simulate those growths. The dentist may be misled in making his diagnosis. Conditions such as this may arise and threaten to become very serious, and yet under almost any kind of treatment, such as a little pressure carefully applied, and the use of astringent applications, they may disappear and never recur.

The time in life, especially in women, when these tumors appear so often is during the period of gestation, at which time all diseases are more prone to take on development, while at other times they would not be so apt to create such a marked disturbance. Under such circumstances surgical interference would be contra-indicated. We should resort to the application of mild astringents. My friend Dr. I. N. Danforth, of Chicago, a gentleman who holds a high place as a pathologist, and who has had considerable experience in the treatment of growths, both malignant and benign, in this special field of surgery suggests the use of tannic acid and glycerine in the proportion of 10 grains to the ounce. It is a simple remedy, and I have seen many of these false tumors or growths simulating epulic tumor, disappear within a few weeks' time. I suppose the term pseudo-epulic might be especially applicable to these conditions. We see the gums enlarged; they become puffy; they bleed readily on the slightest friction or irritation, and under the stimulating astringent action of tannic acid and glycerine they will contract and fully disappear. When the period of gestation is complete they are liable to recur. I mention this because it is a matter of great importance, and anything in the way of surgical interference at that time is not indicated, and with palliative treatment, with careful management without caustics, and without the use of the knife, we can oftentimes arrest the further development of these growths, and indeed, completely overcome and remove them by employing the method that I have outlined. Should I find a case of true epulic tumor, which comes from the periosteum extending up apparently between the teeth and seeming to separate them widely, as they sometimes do, then I think it is well to resort to the vigorous methods suggested by the author of the paper. The only criticism I have on the paper is, that it entered into a very broad field, and that it would have been much better if it had been limited to the consideration of fewer growths and not discussed the subject of tumors in general. In clinical experience I find these growths often recur, and if we succeed in preventing their recurrence we need sometimes to go very much further than

to extirpate the growth itself, to the periosteum, from which it seems to emanate or proceed.

In this connection I would say that in some cases where I have removed these growths I have removed parts of the periosteum and alveolar process, together with one or two teeth, with the idea of going far enough beyond the region of the disease and completely extirpate every part of it. In one case I found that I had not gone far enough, and the growth recurred, required another operation. I have found it best to go far enough so as to be absolutely sure that I have removed all of the tissue which is involved by the morbid growth.

As to the management of the condition, it simply requires antiseptic cleanliness until nature can effect the process of repair. If we have a pseudo-sarcoma, it requires too much time to go into an explanation of the different methods to be employed in treating such cases. I would say, however, that nothing short of thorough operation and going beyond the region of the disease, is liable to effect a cure. The author of the paper referred to epithelioma, and he has truly said that these diseases usually at the beginning are benign. They are susceptible to a perfect cure if taken in time. How frequently do we find a person suffering from an initial lesion of epithelioma who is likely to neglect his case until by and by the glands become involved and he is beyond all human aid. If these cases of epithelioma are treated in the beginning, a perfect cure can be effected ; but let the disease go on and be neglected, as was the case with the late Gen. Grant—whose death was the result of epithelioma caused by a jagged broken molar tooth which he permitted to lacerate his tongue for a long period of time, together with the irritation which was kept up by the continuous use of tobacco—the disease by and by involves the glands of the neck and causes fatal termination. Hundreds of people, through carelessness or negligence, might be relieved of this condition if treated at the inception of the disease ; but they permit it to advance until the condition is beyond the aid of the surgeon. If we have a cyst for treatment we have a condition very different. It is simply an accumulation of fluid. This fluid may be serous or gelatinous ; it may be sebaceous fluid.

One word in regard to dentigerous cysts. I wish to say that these should be opened and their contents removed. Generally, the contents of a dentigerous cyst are such it will continue to

secrete fluid so long as it is permitted to remain, and our only hope of effecting a cure in such a case is to remove the membrane; and this can best be done by surgical procedure, yet by the use of escharotics we can destroy it.

With reference to escharotics I would say that I employ them sometimes, but I do not like to do so. I prefer to make a clean operation, remove the membrane, and then by taking care of the parts, keeping the orifice of the wound open and clean, thus assist nature in bringing about granulations to heal the wound.

I want to say a word or two about carbolic acid as an escharotic. My friend Dr. Taylor says he uses carbolic acid as a means of curing an epulic growth. I would like to sound a word of warning about the use of escharotics in the way of injections. I am afraid that if the dental profession resort to this method generally, they will have patients some day go into collapse. They will find them in such a state of depression, and possibly collapse, which it will be a difficult matter to overcome. The time, I think, is passed when we can take chances of this kind, particularly when other means, which I regard as much better, may be employed.

The loss of bone in the case mentioned is only a single instance, and I fear that if this agent were generally employed we would lose a large territory of bone. I have in mind at the present time a case in which one-half of the lower jaw was lost by the injection of carbolic acid into it. The injection was carried through the apical foramen into the membranes over a sufficient surface to establish an inflammation which resulted in death of one-half of the lower jaw. For that reason I would discourage the use of powerful escharotics in the treatment of these growths.

Dr. C. J. TIBBETS: Unfortunately I did not arrive in time to hear the early part of the paper, but upon making inquiry of Dr. Taylor I learn that nothing was said about the etiology of these tumors. Dr. Taylor informs me that it was not alluded to. To arrive at a proper consideration of the subject, it is necessary to divide it into three divisions, namely, the etiology, pathology and treatment. There are two distinct theories of the etiology of these diseases, namely, the biological and the bacteriological. The early pathologists consider the disease of a truly embryonic character; basing their theory upon the wandering cell, or embryonic origin of these tumors. Such instances are evinced in the development of

teeth and ciliary growths in various remote organs of the body which is used in support of that theory. Later scientists based their theory upon a bacteriological foundation, setting forth their claim that by inoculation their claim is proven to some extent; for instance, in the treatment of the early manifestation of the disease by inoculations of erysipelas and various other bacteriological infections, they claim to have produced recovery by this means. As to the treatment of these tumors, I would advise against too early resort to surgical measure. I would wait until the case is clearly developed before operating; for two reasons, first, that the oftentimes serious consequences of the operation may be avoided; second, for the absolute assurance of the patient as well as the surgeon. In many instances, no doubt, the patient is hastened into an operation through false alarm to suffer lifelong forebodings, of a probable recurrence of a supposed malignant affection, and this suffering in many instances is quite as serious in its consequences as the supposed malignant disease. I have known of instances where surgical operations have been performed in which I am certain the disease was not of a malignant character. One instance in my own practice. The nonintervention of surgery resulted in relief of the patient by palliative treatment when surgical intervention was urgently advised and insisted upon by another surgeon, but recovery resulted without the operation so advised. I would recommend the proper use of escharotics; when properly used the danger is very slight, for instance in the application of nitric acid. The action of it may be limited by using it upon a pine stick, which absorbs the acid and imparts it in sufficient limitation, as to insure definite application when placed in contact with the tumor. One very noticeable case of the beneficial results of this treatment and the ultimate recovery of the patient was where one of our surgeons treated a case of malignant growth of the os uteri with a pine stick saturated with nitric acid. Surgical treatment was regarded impractical owing to the extent of the disease, yet the patient insisted upon something being done to prolong her life, and in compliance to her appeals he resorted to this method of treatment with really no hope of her permanent recovery; but much to his surprise and the patient's satisfaction, it resulted in permanent recovery. As to the frequency of these tumors we are enabled to recognize them before the general practitioner, but I very much question the advisability of resorting to surgical interference before holding con-

sultation with other surgeons. I think this is advisable in all instances, for the protection of our own reputations and the safety and welfare of the patient. I have known so many instances of unnecessary, unjustifiable and irresponsible surgery done by surgeons of renown as well as the mediocre, that it has impressed me with a realization of the serious responsibility of the one who wields the knife.

Dr. THOMAS L. GILMER: I was somewhat disappointed with the paper. I wanted to learn something about the early diagnosis of tumors. The essayist did not give us anything new on that phase of the subject, if he did, I did not hear it. It is not only the privilege but the duty of the dentist to treat these diseases of the mouth. I think as to manipulations in the mouth, we should be able to do most of them better than the general surgeon. The removal of many of these tumors is attended with no more difficulty and requires no more skill than most of the operations that dentists usually perform. I believe that a considerable amount of the periosteum and the bone immediately underlying these so-called epulic tumors should be removed, otherwise we are liable to have a recurrence of them.

There is a class of tumors for which dentists are to a certain extent chargeable. It is a growth caused by poorly fitting artificial dentures. The teeth are extracted and a temporary set placed in the mouth for a few days after their removal, and the plate seems so satisfactory to the patient that it is worn for years. During this time a great deal of shrinkage has taken place and as a consequence we have quite a space between the buccal side of the plate and the buccal surface of the process, allowing the soft tissue from the cheek to grow in between, forming a considerable growth. It is not unreasonable to suppose that this growth, under constant irritation, may become in some cases malignant in character. It is not always necessary that this excess of tissue should be removed by instruments. However, in some instances this may be entirely proper, but if the tumor has not grown to a great extent and has not become inflamed, is not breaking down, the simple application of a properly fitting denture may be all that is necessary to effect a cure.

There is another form of tumor of the mouth that dentists should be a little careful about. The reason I speak of this now is because I know of a case that was operated upon not long ago

by a dentist, and he had a great deal of trouble to undo the mischief he caused. It was not strictly speaking a tumor, but an aneurism. However, it was mistaken for an alveolar abscess, and a large opening was made into it which resulted rather unsatisfactorily, as a profuse arterial hæmorrhage followed. It is safer in such cases to introduce an aspirator or hypodermic syringe and find out the nature of the contents before lancing, unless its nature is readily determined by pulsation or otherwise.

Dr. NEWKIRK : May I ask Dr. Brophy one question? Did you say, doctor, that there is no such thing as a cystic tumor?

Dr. BROPHY : I said a cyst was not a tumor. I maintain that. I stand by that statement, according to the understanding that we have at the present time, as to what really constitutes a tumor. A cyst is not a tumor. It is possible to have a cyst in connection with a tumor, and it may be that Dr. Newkirk wishes to have me state whether it would be possible to have such a combination. Such a condition may exist. A cyst and a tumor may exist at the same time.

Dr. SCHUHMANN (closing the discussion) : I regret the lack of participation in the discussion, only shows that the subject ought to be brought before dental societies more frequently than it has been, so that the members may become more familiar with it. It seems a pity that we should spend four or six years in our colleges, and much of that time in studying anatomy, physiology, chemistry and pathology, and then when we launch out into practice confine ourselves to treating diseased teeth and forgetting almost entirely the wide boundaries of our field.

As to the early diagnostic features of malignant tumors, I would say that any tumor which grows rapidly, which does not present a well-defined outline and produces pain, should be looked upon with suspicion, and I do not think that surgical interference in such a case should be delayed, but to the contrary that the tumor should be operated upon promptly. It is better in my opinion always to cut a little wide of the line of demarkation of a tumor; in other words, I think it best to be safer to cut *too wide*, than *not wide enough*.

The object of the paper was not to describe each individual tumor, nor to describe the treatment of each, but to point out the differential points and if possible to classify them in a few groups to simplify the study thereof for those who care to pursue it, it would

be impossible to give a satisfactory history of each variety in the short time allowed here. By noting the different divisions of growths, the manner and seat of origin, the whole picture which to most of us may have at first appeared much befogged, becomes cleared up and is easy to master by a few hours' further study, at least sufficiently to give us such a clear and lasting impression of the study of tumors that minutiae simply becomes interesting reading matter rather than bemuddling words. I thank you for the kind reception of the paper.

DISCUSSION ON DR. MOOREHEAD'S PAPER (SEE PAGE 422).

Dr. J. E. KEEFE: In opening this discussion there is one point made by the essayist that I want to emphasize, namely, that cataphoresis or electrical osmosis is not new. There seems to be a prevailing opinion among some of the members of the profession that cataphoresis or the medication of tissues by electricity is new, and that this is a fad. It is to Dr. Morton and Dr. Gillette, I believe, the two gentlemen who have done most of the work along this line so far and have written practically all the articles of interest on this subject, to whom we are indebted. I think the credit is due them of resurrecting this old method and giving us new ideas in this way. They have given us new instruments to work with. The former method of producing this effect was by the use of an instrument, whereby they could force in a volt at a time. This method has never been a success, although it has been tried by many, and some of the gentlemen here have tried it before, but were not successful. Dr. Morton in this month's issue of the *Dental Cosmos* (May) tells us that he uses this method in a new way and for a new purpose. Heretofore, in all articles written upon this subject, we have been advised to use only platinum points. The writer states now that he uses copper and zinc points. We were told to use platinum points for the reason that they would not corrode. He states that he uses copper points because they do corrode, and he speaks of one case where he treated a dermoid cyst with copper points. As you all know, in electricity the positive pole is an acid pole. The negative is alkaline. In the positive pole he puts the copper point, inserts it into the cyst and dissolves the copper point in the cyst. What occurs when this copper point is put into a piece of tissue, as raw beef? There is given off oxygen and

chlorine. The oxygen takes the copper point and the chlorine the zinc. We have two salts which make oxychloride of copper. The oxychloride of copper, he claims, is diffused into the dermoid cyst, and by this method he has dissolved the cyst. These are some of his latest operations, and there have been so many things suggested and retracted that we do not know just yet where we stand. In the article of last month he says he did not use anything but platinum points. In this month's article he wants this deposit for the treatment of tissues. He gets the same results from a zinc point. I will demonstrate this to-morrow at the clinic, showing the deposit in the water.

I will tell you of a few experiments I have been conducting in teeth which I have opened up and found the pulp in a putrescent condition. I used in all of these cases in the mouth Dr. Black's 1, 2, 3, with the addition of salt, first putting salt in the pulp chamber and applying my electrode. In fifteen minutes I was enabled to clean out the pulp chamber and fill the root. It is about six weeks ago that I did this. Another one about three weeks ago, and I have not had any trouble so far. Of course, the work was simply experimental. I also took twelve freshly extracted teeth, invested them in plaster of Paris, and in those teeth I placed guaiacol-cocaine, put in my electrode and turned on twenty volts for five minutes; the average was five minutes, although some were ten. Then I turned it over, cut the plaster away from the roots, leaving the latter exposed, and I could detect the guaiacol-cocaine. The guaiacol of cocaine is recommended very highly by all who have used it, for several reasons. One of the principal ones that I might mention is this: You probably have read in one of the journals where a gentleman, a Mr. Evans, of the McKesson and Robbins Company, says that by experiments which had been conducted, the cocaine is held in solution. They take a drachm of pure guaiacol and a drachm of cocaine, mix them in an ounce of distilled water, and shake thoroughly. After making this test they find that 12 per cent of the cocaine has left the guaiacol, showing that the guaiacol will hold 88 per cent of the cocaine. In this way it is recommended very highly as being useful in connection with operations, not only hypodermatically, but otherwise.

Cataphoresis is not applicable in all cases. It is only occasionally that we can use it in very severe cases, and they are the

ones where we can save time. Some gentleman will say perhaps that it takes twenty minutes or half an hour to prepare the cavity, and that he can do it in that length of time by the usual methods. He cannot do it to his satisfaction in that time. He can prepare it in a way, but the patient suffers and he suffers too indirectly. But by applying guaicol-cocaine, or cocaine in 15 or 20 per cent solution, whatever you wish to use, for fifteen or twenty minutes you will find you save time at the end of the operation. Guaiacol-cocaine should not be used in full strength on the mucous membrane. It should be diluted for the reason that it is a powerful irritant and a powerful conductor. Several oils are recommended to dilute it with. Oil of pine is what I have been using. Almond and olive oil can also be used. Of course, we must remember one thing, and that is this, we have not experimented with this process long enough to be able to tell what the results will be to the pulp or to the tissues of the teeth. For the last year there have been quite a number of experiments made, and I have not read or heard of any cases reported where the patient returned with the teeth in a hypersensitive condition, nor have I had any patients return. I have applied this in fifty-two cases and have not as yet had any bad effects.

As for bleaching, it is worth the cost of the instrument and the trouble for that one purpose because in twenty minutes or half an hour one can bleach any tooth that needs bleaching. It can be done in ten or twenty minutes by this process, with the formula mentioned by the essayist.

I had an experience the other day that this method led up to. The patient was a young man, one of those fellows who comes into the office and wants to put his feet on a window sill, etc. I told him I had something which will take all the sensitiveness out of his tooth. He told me to give him anything I had. I assured him it would not hurt. I proceeded in the usual way, but at the same time was a little awkward and afraid of it. In about twenty minutes I removed the electrode, entered the cavity and prepared it in a few minutes. It was a labial cavity and was an easy one to prepare. I do not believe I could have done it in two hours by the other method. I filled the cavity for him and he went out of the office happy. He felt satisfied with the operation. He telephoned the other day for another appointment. I gave him one, he came in, and I did not think about the cataphoresis for him

because I do not use it in every case. I use it perhaps once every other day. He came in and said to me, "Were it not for electricity I would not show up here for two years." I took my electrode, put in guaiacol-cocaine, moistened the negative pole, had him hold it, put in a platinum needle and started working with the instrument I had. I said to him, "Do you begin to feel it?" "Oh, yes, in this hand," he said. I started working it up, killing time for five minutes. I then took it off. You talk about hypnotism in preparing cavities. There was nothing done to it whatever. The patient was simply hypnotized. If you want to use it for any other purpose, hypnotize your patient first, then use it afterward or not.

I would like to call your attention to the rheostat that Dr. Custer has, which I believe is the coming rheostat. I mean by that a rheostat used with mercury. You can make many similar rheostats. Any one of you gentlemen can have a rheostat made that will cost you \$5, \$6 or \$8. If you have any kind of rheostat in your office at a small expense you can have it turned into a volt selector, as it is called, and the cost will be nominal. But Dr. Custer has one which is the cheapest and best I have seen so far, and I have done considerable experimenting with them.

Dr. L. E. CUSTER: I do not know that I can say anything additional to what has already appeared in print in the last issue of the DENTAL REVIEW. But since that time, however, I have been making a few experiments in order to get some statistics, so that any dentist might construct his own appliance and save the expense also of a volt meter, as well as ampere meter. I can best illustrate this on the blackboard, and that will be all I have to say, inasmuch as the doctor who has preceded me has pretty well covered the ground. So many statements which are peculiar have appeared in the reports of cases from an electrical point of view, that I can only refer you to articles I have already written.

Dr. WASSALL: Dr. Custer has been kind enough to describe his apparatus, but he has told us nothing about the results he gets from the use of it. We would like to know the results he obtains from the use of this method.

Dr. CUSTER: The results have been exactly in proportion to the length of time and intensity of current. In the paper this afternoon the temperament of the patient and the susceptibility to the electric current were factors that were discussed, but of course it is well known that we can apply but little current in certain cases,

and in such instances we must not expect to get as good results. The final result is exactly in proportion to the amount of current you use and the amount of agent which you have projected by it. I have noticed that decalcified dentine, or dentine from which the enamel has been worn off by abrasion, is almost like enamel, a nonconductor probably from the infiltration or filling in of the tubuli. In those cases you get but little current through as the preparation is not very painful at any time.

Dr. C. B. ROHLAND: I would like to know whether any of the gentlemen who have had experience with cataphoresis in the use of cocaine have ever found any systemic effects from its use—whether there have been any poisonous effects from the use of cocaine in that way, or whether they have pushed it far enough to have systemic effects?

Dr. KEEFE: I have never noticed any systemic effects, because I have never used the aqueous solution of cocaine either on the mucous membrane or on the tissues. I have done a great deal of experimental work on the tissues of the arm and mucous membrane, but not with the aqueous solution of cocaine. With the guaiacol-cocaine, I believe I neglected to mention the results obtained by this method on the dentine. They were all satisfactory, but I did not get in seven or ten minutes' good results. They will average twenty minutes.

Dr. ROHLAND: The point I desire to bring out is this, whether there is any danger from the use of cocaine employed in the manner described, and whether caution should be exercised the same as when it is used hypodermatically. That is the point I desire to bring out.

Dr. WASSALL: It seems that I was unsuccessful in getting an answer to my previous question. I wanted to know from Dr. Custer just how useful it was in his practice, what the results were in diminishing the pain of dental operations, whether it had a hypnotic effect, as Dr. Kirk found it had sometimes, and whether it is a useful agent in producing anæsthesia.

Dr. KEEFE: I think I have just answered that question. I have always had good results from the use of it in all cases. I have never yet had a failure. I keep it up until I get results.

In regard to Dr. Rohland's inquiry, I will say that with the guaiacol-cocaine the cocaine is held in solution by the guaiacol. It does not enter the system as the aqueous solution of cocaine

would, and therefore there is no possibility of toxic effects, and in using the drug on the mucous membrane or on the arm we do not have to leave it on over two or three minutes to produce the result. One can use any kind of volt meter on the arm or mucous membrane for that purpose, run it up to ten volts and the patient does not feel it at all. He feels only a smarting from the guaiacol-cocaine.

Dr. CUSHING: Any constitutional effects?

Dr. KEEFE: No.

Dr. CUSTER: I have been watching the cases as closely as possible and have thus far seen no bad results. I have been tabulating every case at the time of the administration and have seen no systemic effect. The fact is we cannot have a systemic effect from the amount of cocaine which is projected.

Dr. CUSHING: Will you answer Dr. Wassall's question?

Dr. CUSTER: There is no question in my mind but what it is an effective agent, and the effect is in proportion to the amount of cocaine which you project in there. It is practical and in my own practice I probably use it once every other day. It averages that during the week. I use it in those cases where we resort to something unusual to meet the case in hand. In those cases I find that it does give the results which we are after.

Dr. CUSHING: Uniform success?

Dr. CUSTER: Yes, in proportion to the length of time and strength of current.

Dr. W. W. MOOREHEAD: In regard to the toxic effects of cocaine, I wish to state that I noticed in the report of one of the eastern dental societies a statement made by a dentist that he had never been able to use a 4 per cent solution in his own mouth; that the smallest quantity produced an irregular action of the heart. But he has had a number of operations on sensitive dentine in his own mouth performed by Dr. Gillette, using a 25 per cent aqueous solution of cocaine without noticing any effect whatever. By the process of cataphoresis the cocaine is not thrown into the circulation at once, but it takes from five to twenty minutes to reach the circulation, and in obtunding the sensibility with a 25 per cent aqueous solution it takes only a small quantity on a pellet of cotton to produce the necessary anæsthesia.

Dr. CUSHING: May I ask what amount of the solution is taken up in an ordinary operation for producing the anæsthetic effect?

Dr. MOOREHEAD: I could not say. I do not suppose that more than a minim, if any, is taken up, because even after the application there is still some in the cotton that has not been carried through.

Dr. CUSHING: You say that in the ordinary operation about one minim of a 25 per cent aqueous solution of cocaine penetrates the tooth and enters the system?

Dr. MOOREHEAD: I would suppose that to be all. In regard to guaiacol, I have been adding enough more cocaine to make a 20 per cent solution, which gives better results than the 10 per cent solution as prepared by McKesson and Robbins. The only objection I have to guaiacol is its odor which is similar to creosote. Some people object to it.

Dr. CUSHING: Your success has been uniform?

Dr. MOOREHEAD: Yes. In over three months' practical use I have only found two cases which were so susceptible to the electric current that it was impossible to use more than ten volts and the anæsthesia in these cases was only partial. But in the majority of cases by prolonged application the anæsthesia was satisfactory.

Dr. CUSHING: The length of time seems to be the essential point in these cases?

Dr. MOOREHEAD: Yes. Some patients require more time than others.

Dr. W. V.-B. AMES: In regard to the matter of toxic effects from the use of cocaine, this phase of the subject cannot enter into the question if the drug is used as it should be, very carefully, and you only get the effect of the cocaine by cataphoresis. I do not believe it enters in such a way as by injection. I believe it is only carried into the tissues as far as you want it. When you get pain no longer from the current the cocaine has only been carried into the tissues as far as necessary to bring about results on those tissues in which you wish to operate.

After Dr. Gillette read his paper last summer, and it was published in the *Cosmos*, I took a battery which I had in my office at the time and began to do some of this work. I did not get very good results in the first few cases of sensitive dentine in which I tried it, simply because I did not have sufficient voltage and take the necessary time. But I did eventually get excellent results in the extirpation of pulps. There is no question about this method

being practical, and it is a process from which we can get wonderful results.

Dr. CUSHING : You told us a moment ago that you did not get good results in obtunding sensitive dentine.

Dr. AMES : Yes, but it was simply because I did not have proper voltage and take the time to do it at first. I would have secured good results if I had had a better apparatus with which to do the work, and had taken the time to do it well.

I have been reading Dr. Morton's article, and one of the first things that impressed me was that there is too much ado about the difficulties of this method and the complicated apparatus that is necessary in using it. Any one who has done electrolytic work can make use of this method. This subject was touched upon by Dr. Morton in his article in the May *Cosmos*, wherein he speaks of "metallic electrolysis." The term is not very expressive, yet the suggestion strikes me as opening up a wide field in cataphoresis. He uses the electrodes that were spoken of by Dr. Keefe. Personally I prefer a zinc electrode to copper because it is not so apt to create the bad taste and discoloration as which comes from copper salt. I would expect as good results from using a zinc electrode in the treatment of all pyogenic conditions of tissues about the mouth. I had some ideas bearing on this subject ten years ago, but did not think at that time of the application of the cataphoretic principle. By this method we not only dissolve the zinc, but by the principle of cataphoresis the zinc salts are carried into the tissues. Your elements find their way toward the positive pole and act upon it, and the process of cataphoresis carries the resulting salt right in. In nine cases out of ten of filling operations we can get along without cataphoresis, but in occasional cases it can be used to great advantage.

With reference to bleaching teeth, I do not think it is worth while to have this apparatus for that purpose. I have bleached teeth beautifully with it for years, but they do not remain so better than when they are bleached by any other method.

For the sterilizing of roots containing putrescent pulps the process has been highly satisfactory. Some years since when the immediate root filling craze was on I found that this was the most reliable means at my command for sterilization. I took a platinum positive electrode and decomposed the pus right in situ, making the sterilizing agent from it.

Dr. CUSHING : What was the result of your work at that time?

Dr. AMES : I was enabled to sterilize the root immediately with the most satisfactory results. In my work of this kind for ten or a dozen years, I have been decomposing iodide of potassium in pyorrhœa pockets and fistulæ, and having some of the iodine carried into the tissues by cataphoresis without knowing of all that I was accomplishing. The light on cataphoresis opens a large field.

Dr. MOOREHEAD (in closing the discussion) : A few words in regard to the process of bleaching. Here are two molars which to start with were of the same color. They had been extracted for some time. One of them I bleached according to the process given in the paper. The other is just as it was. You will observe that not only the crown is bleached, but also the apex of the root. By comparing the two you will notice a decided difference in color.

In regard to volt selectors, I have no special claim to make for the Wheeler volt selector, but I must say I am much pleased with Dr. Custer's volt selector which was used in the clinic. It appears to be simpler and a better arranged instrument than the one I have.

Dr. TAYLOR : You have made reference to bleached teeth out of the mouth, what are the results in the way of permanency of teeth bleached in the mouth? Do they remain bleached?

Dr. MOOREHEAD : My experience with bleaching has not been sufficiently extensive to say whether the teeth remain bleached or not.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: A. W. HARLAN, M. D., D. D. S.

ASSOCIATE EDITORS:

THOS. E. WEEKS, D. D. S.

A. E. MOREY, PH. B., D. D. S.

GIVING DUE CREDIT.

As we have been requested to express ourselves on the question of doing justice to another journal by giving credit on a republication of matter, we desire to state that we always give credit when the source of a clipping is known. We think Dr. Bethel is quite right in his warfare against such scissoring as is indulged in by the *Items of Interest*. We do not think it necessary to say much on the subject as it is well known that the best matter in that journal is nearly always borrowed from other sources—that is what it is in the field for. We have watched the journal grow from a leaflet to its present size, but in our opinion it was more interesting in the days of its “fonetic” tooth cutting than now. The editor will please not do so any more and Brother Bethel will not scold him again.

AMERICAN DENTAL ASSOCIATION.

We urge every one who can do so to attend the next meeting at Saratoga the first Tuesday in August. Leading hotels are the United States, Congress Hall and the Grand Union.

MUMMIFICATION.

One of the anomolous things connected with the practice of dentistry is the idea that a tooth pulp can be mummified and be allowed to remain in the canals of a tooth with a filling over it for an indefinite period. In no other portion of the human body would a surgeon dare to try and mummify any soft tissue. Rarely

there is mummification of a foetus but what are the results? Always disastrous. In the recent literature—covering the past five or six years—we are offered from time to time a new method of “obviating the necessity for removing a devitalized tooth pulp.” Sometimes it is Herbst, again it is Miller or Soderberg, or De Ford or some one else. Coleman proposed many years ago the use of arsenic and chalk, or arsenic, chalk and creosote. Fletcher used glycerine, chalk and arsenic. Witzel has also offered several formulæ for drying up the pulp. Soderberg uses alum in his mixture, claiming that it is useful in tanning leather. Under just what circumstances, leather, after it is tanned with oak bark or alum is placed in the same conditions that a tooth pulp is, is not apparent to the writer. The past forty years or more has not sustained the idea that tooth pulps selected or chosen at random can be allowed to remain in a sealed chamber indefinitely. All of nature’s laws point to the fact that a thing which is dead ought to be removed. This is true of other portions of the human body, why not of the teeth? There is no certainty that the apical end of a tooth can be encysted, or that it will be encysted after the soaking of a pulp in a paste of Witzel, Miller or Soderberg’s composition. It is hardly possible to suppose uniformity under such circumstances. Ten or 20 per cent of successes would not justify such practices. With our present knowledge and the perfection of methods of removing pulps and filling roots no one would care to risk his reputation in private practice on such a slender foundation as the mummification of pulp rests upon. The gentlemen who are pounding away at this subject would better employ their talents in the direction of complete removal of pulp, when dead, and the subsequent filling of roots with unalterable precision than to advise or employ such uncertain means to retain dead pulps in teeth with the possible consequences to the patients, innocent in knowledge of such attempts at experimentation upon them. We would not expect to place a crown or bridge upon a tooth treated to mummify the pulp, why then should we expect a better or more certain result under a filling?

STATE SOCIETIES.

Secretaries of State societies will confer a favor if they will send in the next place of meeting, the date and the lists of officers for 1896-7; also the office address of the secretary.

AMERICAN DENTAL SOCIETY OF EUROPE.

The annual meeting of the above society will take place in Dresden, Monday and Tuesday, August 4 and 5. Dr. J. H. Spalding is the president, and Dr. W. A. Spring, is the secretary. In case the committee provides a lengthy programme, the meeting will hold one on Wednesday also. Probably a proposition to hold a congress in 1897, in Switzerland, will be presented. If this is done the congress will be under the patronage of the American Dental Society of Europe, and the Swiss dentists.

It is a long way off until 1900, and a small gathering, international in character might be of great assistance to the Paris Congress. Visitors from other countries and especially Americans will be welcome at Dresden.

FOREIGN CORRESPONDENCE.

LETTER FROM BERLIN.

BERLIN, N. W., June 18, 1896.

TO A. W. HARLAN, M. D., D. D. S., CHICAGO, ILL.

Dear Doctor:—It may be permitted to reply to your editorial, "Thirst for a Diploma" in No. 5 of the DENTAL REVIEW, 1896. Firstly an error or with respect to your speaking of "tooth artists" soon after, a *scripturae mendum* must be rectified. "As the D. D. S. does not carry the right to *practice* in Germany. * * *" There is liberty of trade in Germany, also for practicing medicine and dentistry (a law in this extension, I am told, the free U. S. A. are not in possession of), in consequence of this liberty a D. D. S. is allowed to practice likewise as any other man or woman. But all these just quoted persons have not the right to bear the title of a "Zahnarzt;" this is a privilege and the only one, of those having studied in Germany *rite*, and being officially approbated by the the royal minister—after a successful examination. You continue to ask: "* * * of what value is it to the holder?" In order to answer this question it is necessary to make a distinction between "Zahnärzte" going over there and "tooth artists," "tooth workers" as you translate, in German "Zahnkünstler," "Zahntechniker" and "Zahnarbeiter." This last mentioned expression, tooth worker is applied by state organs in order to point out an opposition between "Zahnarzt" and "Zahnkünstler," and it is the offi-

cial signification used by the "Gesellschaft deutscher Zahnärzte" a society with the motto to defend and extend the privileges of the German "Zahnärzte" even against those holders of a D. D. S., who practice in Germany without possessing the title of a "Zahnarzt" and naturally against those men practicing without any diploma. Here it may be allowed to state that the well-known Prof. W. D. Miller is an honorary member of this society. From this fact and the other that he does not bear the title of a D. D. S. you will conclude that he is proud of now being a *German* "Zahnarzt." We think he is really indebted for his exalted scientific position, more to Germany than to America in spite of the *chauvinistic* (and the chauvinistic perception unfortunately prevails in the American writings of the last times). I say of the chauvinistic quotations met with in all your journals, i. e. : "* * A text-book of American dentistry in the German language." "Yet it is not difficult task to recognize those made in America or copied from American literature" and so on ad infinitum.

Yet let us return to our subject—the German "Zahnarzt" whose purse is full enough, goes to America in order to *continue* his professional education, for a possibility to learn is given *everywhere*, and it is not contestable that many good things are taught at your colleges. Till now we are not fallen into such a degree of partial judgment or of chauvinism, as it were, to think perfection be only found within *our* country. On account of the knowledge of foreign languages our German educated men, I confess, find it an easy task to adopt the scientific acquisitions of foreign countries. Suppose your dental students, or better as an equal comparison, your young dental surgeons would in some measure be versed in "German as she is spoke," we would have the pleasure I am sure to salute your compatriots more frequently at our "dental institutes" than now and certainly not to the prejudice and damage of the former. They would turn their attention to our literature a little more than now to-day, and, in order to quote a trifle, it would not be necessary to renew the discovery of the old-known Leclus' elevator for extracting lower wisdom teeth—what has happened in America within the last months.

You will not be astonished that from America my colleagues take the "doctor" as an agreeable gift (more frequently, it may be, the sole attraction is the title of a "doctor") ; if you consider that we live in a country where the public often judges only from

the title of a "doctor"—"Dr."—to the distinction between officially approbated men and those practicing without any "approbation." I think to be understood after the above said. Finally, it is a privilege of our universities—not of the State. (This gives *approbations* as a physician and surgeon, a dental surgeon—Zahnarzt, etc.,) to grant the diploma of a "Dr."; and last, not least, a German diploma of a *doctor* of dental surgery does not exist.

Now to the second category of the flock coming over there. Though the number of dental schools (more correct it would be to say dental institutes of the Royal, etc., Universities) may be doubled, for all that these would not "give them anything for their money" unless these "students" fulfilled the preliminary conditions for study and State examination. Why these gentlemen endeavor to go to America, you will understand without any commentary.

Do you in fact wish a removal of the nuisances summoned in your editorial, I must state—without attempting to meddle with your affairs—that it is within *your* power to alter the requirements of admission and of graduation at all of your colleges. Consider the German "Zahnarzt" as a colleague and not as a freshman, let the other ones coming over there without "State approbation" "work for a D. D. S. *just* as your boys do," and elevate the preliminary conditions for study. The success will be that even in Germany a D. D. S. is fully acknowledged as equal to our "Zahnarzt," and moreover, you would be delivered from "such students coming over there." Our State institutes are not so covetous of money as to "obtain these students." You render a service to both the countries, the United States and Germany.

Yours truly,

ZAHNARZT HANS ALBRECHT.

Editor of the Odontologische Blätter, P. A. Secretary of the Berliner Zahnärztliche Gesellschaft (not of the mentioned Gesellschaft Deutscher Zahnärzte). Assistant at the late Professor Sauer's clinic.

KARL STRASSE 8.

MEMORANDA.

Do you mummify pulps?

Dr. Geo. A. McMillan is in Europe.

Dr. E. H. Angle has gone to Europe, for a short vacation.

Dr. John S. Marshall has gone to Europe for a two months' visit.

Licenses for obtunding dentine are not going like hot buns in Chicago.

About 250 were present at the Inter-State Meeting at Excelsior Springs.

Not one dentist a delegate to a national convention—of politicians—of course.

A NEW REMEDY FOR PYORRHOEA.

Y Chwavenon!

Dr. A. W. Sweeny, of Washington, D. C., paid a flying visit to Chicago in June.

Dr. Dunn says to use trichloroacetic acid not more than 10 per cent for "canker" sore mouth.

Eucaïne is a valuable enrichment of our armamentarium; and will be at least a very dangerous rival to cocaine, as soon as it is better known.

AMERICAN DENTAL ASSOCIATION.

The American Dental Association will hold its thirty-sixth annual session at Saratoga Springs, N. Y., commencing at 10 o'clock A. M., Tuesday, August 4, 1896.

GEO. H. CUSHING, *Recording Secretary*.

CHEAP DOCTORING.

Anxious Mamma—"Little Dick is upstairs crying with the toothache."

Practical Papa—"Take him around to the dentist's."

"I haven't any money."

"You won't need any money. The toothache will stop before you get there."
—*New York Weekly*.

Dr. Griswold, of Denver, uses a solution of nitrate of silver to wet the inside of the root, and then forces amalgam into it as a root filling. Dr. Dunn says the specimens look very well. How about the stain? Will it blacken the tooth in time or will it remain clean. A certain school of therapeutists and chemists will tell you that it will penetrate through the sides of the root. Will it?

Now we are confronted with the advertiser who tells you how to build a practice. With printer's ink, of course. The best method of building a practice is to fit yourself for it and then go to work where you are needed and where work is to be done, and charge for it according to the circumstances of the individual you are working for. You will find this to be the best "practice builder" to be had and it costs you nothing.

All dentists in the State of Iowa and all other States are invited to attend the annual meeting of the Northern Iowa Dental Society, to be held at Spirit Lake, August 11, 12, and 13. A good program has been prepared. Here is an opportunity for dentists to combine business with pleasure as one feature of the meeting will be its social enjoyments in the way of boat rides, concerts, etc.

GEO. H. BELDING, *Secretary*.

The thirteenth annual meeting of the Minnesota State Dental Association will be held in Winona, August 19, 20 and 21, 1896. The executive committee decided to change the date from the usual time to the above date. The meeting will be more practical and interesting than ever. Among the social features will be an excursion on the Mississippi River, given by the Winona County Dental Society. A cordial invitation is extended to all to join with us.

H. L. CRUTTENDEN, *Secretary*.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The annual meeting of the National Association of Dental Faculties will be held at Saratoga Springs, on Saturday, August 1, at 10 o'clock A. M. The executive committee will meet on Friday, July 31, at 10 o'clock A. M. Those having matters to bring before this committee will do well to bear this meeting in mind. The work of this committee is preparatory to that of the general meeting. All communications requiring the attention of the executive committee should be sent to the chairman.

DR. J. TAFT, *Chairman of Executive Com.*

DR. LOUIS OTTOFY, *Secretary*.

Berkshire Building, Cincinnati, O.

Masonic Temple, Chicago.

THE PAIN-RELIEVING PROPERTIES OF GUAIACOL.

The *Journal des Praticiens*, February 29, 1896, says: At a recent meeting of the Academy of Medicine of Paris, Ferrand made a report upon the researches of Pise on the application of compresses of guaiacol for the relief of painful points underlying the skin. It is his custom to wet a compress with from fifteen drops to one drachm of guaiacol, apply it to the part affected by pain, and bind it on with a gauze bandage. Not only is the pain thereupon markedly decreased, but anæsthesia is so complete that minor surgical operations can be performed upon the part. It is absolutely necessary that the guaiacol should be pure. If left too long in contact with the skin and used in very large amount, it may produce a fall of temperature and symptoms of collapse.

AMERICAN DENTAL ASSOCIATION.

The annual meetings of the American Dental Associations will be held at Saratoga Springs, N. Y., July 31 to August 7, 1896. The regular meetings of the American will begin Tuesday, August 4.

The Grand Union Hotel has been selected as the headquarters and the meetings will be held there. Ample space for committee rooms and exhibits has been secured. The ball room and club house, connecting with ball room, have also been placed at our disposal.

The railroad arrangements have not yet been completed, but we expect to secure the usual fare and a one-third rate. Tickets good three days before date of meeting and three days after date of closing. Dentists should pay full fare in going and take a receipt therefor, as it will be impossible to secure the one-third rate in returning unless you hold such receipt.

J. N. CROUSE,

Chairman Executive Committee.

THIS TIME IT IS "BICYCLE TEETH."—QUEER COMPLAINT THAT BOTHERS PHILADELPHIA RIDERS—WHAT CHICAGO DENTISTS SAY.

It may be something peculiar to the Eastern climate, to the dust of the East-

ern roads, or to some peculiarity about the Eastern method of riding, but the fact remains that down Philadelphia way bicycle riders are in large numbers affected by what the dentists call "receding gums." The offices of the dentists, according to a Philadelphian's tale, are over run with wheelmen and wheelwomen who want to know what is the matter with their teeth. They complain that they have more and more exposed ivory surface for every day that they live, and that unless some remedy is speedily found they will all either soon be fang-toothed, or will lose molars, incisors, and canines altogether.

The story goes that it took the dentists a long time to find out that the complaints came only from riders of the wheel. They put two and two together, and have put a peremptory stop to the riding of wheels in the Quaker City until they can evolve a remedy for bicycle teeth.

Chicago dentists laugh at the story, and say that if there are such things as bicycle teeth in Philadelphia they constitute the only thing in which the Quaker City is ahead of Chicago, and they add that they don't believe they ride fast enough in Philadelphia to injure any part of the anatomy.

ANÆSTHESIA AFTER COCAINIZATION OF THE NARES.

The *British Medical Journal*, March 7, 1896, says: Gerster (*Annals of Surgery*, January, 1896,) reports the results of observations made in collaboration with Mayer and Theobald, on one hundred cases of anæsthesia, in which he found that a preliminary application of a 10 per cent solution of cocaine to the nasal mucous membrane considerably diminished, in most instances, the distress and oppression felt by the patient at the beginning. In almost all the cases, excepting those of confirmed alcoholics, the patients manifested less reflex irritation than usual; they became insensible more rapidly and quietly, and with less struggling, coughing, and nausea; and especially, when ether was used, the mask could be approached to the face of the patient much more quickly, and without resistance. The later stages of anæsthesia were also less disturbed than usual by interruptions. In some cases, however, in from twenty to twenty-five minutes after the first application of cocaine, a marked acceleration of the pulse rate and facial pallor were observed, and subsequently profuse sweating. As to the aftereffects, Gerster believes that the patients suffered less from nausea, vomiting, headache, and general malaise. Some few patients, however, who did not vomit at all during the first twenty-four hours, vomited a great deal on the second and third days. It is concluded that, on the whole, in view of the ease and simplicity of the procedure, of the absence of apparent risk, and on account of the undeniable diminution of the trying subjective effects upon the patient, the use of cocaine upon the nasal mucous membrane deserves extended trial.

CONVERSATION FOR DENTISTS.—TELLING GOOD STORIES TO DISTRACT THE SUFFERER'S ATTENTION.

The dental profession in Vienna has formed a novel society which proposes to instruct its members in the art of pleasing conversation, garnished by light anecdote, says the *New York Journal*. The theory of this is that the patients undergoing long and difficult dental operations need to be amused and entertained.

The preamble to the call of the society recited the fact that the modern race of dentists were giving altogether too much time and attention to the scientific side

of the profession and not doing enough to attract and interest their clients. Careful, persistent and thorough work, it went on to say, is one thing, and it is highly necessary that no operating dentist should forget that the patient in the chair has none of this kind of stimulus, nothing whatever to interest him and is generally suffering besides. The real dentist should be able to do his work deftly and quickly and at the same time, by clever talk, keep his patient's mind off of the operation.

Hitherto the dentists, from the moment they began their course of study, have set their attention severely on practical science and have given no time at all to the lighter side of life. The greater number of men are hard students always and they let the frivolous side of the world go in their pursuit of knowledge.

This has given the American dentists who have settled abroad in the continental towns opportunity to work up large and flourishing practices merely because they have taken pains to be interesting to their patients and have amused them. What the Viennese society proposes to do is to start classes in the art of conversation and to get the staid scientific men in the way of chatting while their hands are employed in doing the most delicate work.

IN MEMORIAM.

C. W. SPALDING, M. D., D. D. S.

Died.—At Riverpoint, R. I., June 9, 1896, Dr. C. W. Spalding, in the eighty-second year of his age.

Dr. Christopher W. Spalding was born March 15, 1814, in Rhode Island, of Scotch origin. His ancestors were prominent in the Revolutionary war.

Dr. Spalding received a common school education. In 1840, he removed from his native State to New York State. In the same year he began his professional studies, and received the degree of Doctor of Dental Surgery in 1851, and that of Doctor of Medicine in 1869.

In 1847-48, Dr. Spalding spent a year in Savannah, Ga. In 1849 he removed from Ithaca, N. Y., to St. Louis, where he resided for many years.

He took a leading part in the organization of the Western Dental Society in 1851, and has been prominently identified with the American, several State and city associations, and has been actively engaged in every good work which would tend to elevate the profession of his choice.

He was also an ardent advocate of the Homœopathic school of remedies, and was very successful in their administration.

In 1838, Dr. Spalding married Miss Cornelia Anna Erb, also of Revolutionary stock. Of this union there is one son, Dr. Jno. H. Spalding, who succeeded to his father's practice in this city.

Dr. Spalding and wife, whose death preceded his over a year and a half, removed to Rhode Island August, 1890, to spend their declining years in the State of their nativity.

In the death of Dr. Spalding we have lost an earnest and faithful laborer in the healing art, and

Resolved, That a memorial page be set aside in the Society's Transactions, and a copy furnished the journals for publication.

H. J. McKELLOPS,	} Committee of St. Louis Dental Society.
WM. N. MORRISON,	
J. B. NEWBY,	

St. Louis, Mo., June 19, 1896.

THE DENTAL REVIEW.

Vol. X.

CHICAGO, AUGUST 15, 1896.

No. 8

DENTISTRY IN THE ORIENT.*

BY RICHARD HENRY KIMBALL, D. D. S., CHICAGO, ILL.

Under this caption I purpose making the attempt to introduce you to a few of the scenes and events of a dentist's life in China. Some will interest you purely from a professional standpoint; at the same time I must crave your indulgence, if, as we wander about, there are introduced many incidents that the most charitable interpretation would fail to make relative to dentistry.

Recently, when your committee requested me to prepare a paper for the June meeting of the Society upon "Dentistry in China," I asked to be assigned to a later meeting in the year, as it was my desire that, before attempting to present this or any subject akin to it, I should succeed in obtaining certain dates, figures facts and other matter, which I am getting together, most of which relates to this particular subject.

I felt that, with the native's crude outfit and a few exhibitions of his handicraft before you, augmented by a series of lantern slides illustrating various interesting features of Chinese life, I might perhaps succeed in presenting in an acceptable, and possibly entertaining manner, what I happen to know concerning "Dentistry in China." How then, with all of the just mentioned entertaining features lacking, and the very short time at my disposal, am I to cope with the greatly broadened subject given in the list of papers for the year, of "Dentistry in the Orient."

The title is certainly comprehensive, and perhaps even misleading, since I fear it may lead you to expect more than it is possible for me to provide at this time.

*Read before the Chicago Dental Society.

Geographically the subject extends far beyond the limits of my personal knowledge, and I shall in the main attempt to deal with it only so far as I can speak from individual experience and observation. In treating any subject relating to the Orient, it is not only important but essential that we have some knowledge of the history of the particular country under consideration. It is not my intention to enter upon any historical sketch of China, for probably none of you are particularly interested in the earlier or even the later history of this people; it is nevertheless true that they are, as has been so often stated, "peculiar." They are much more than that; they are a wonderful people, and present quite a curiosity in the history of nations, a careful study of which gives the student a valuable and important clew to the character of the Chinese people.

We are apt to forget, even if we ever fully realized the fact, that the bit of strange humanity that occasionally drifts near us, in the living whirlpool of our city streets, is a citizen of what is unquestionably the oldest nation in the world—as has been said—"their history dates back to a period where no historian would dare to state an exact date."

They speak the same language, and observe the same social customs they did several thousand years before the Christian era, and they are the only living people to-day who were contemporaneous with the Egyptians, Assyrians and the Jews.

They have carried on their own affairs and struggles; maintaining almost unchanged the boundaries and proportions of their empire, ignorant and indifferent concerning the events taking place about them, and which make up the history of the other nations of Europe.

As early as A. D. 1295, Marco Polo had traveled extensively through China, and brought to Europe the first knowledge of that other country lying still farther to the East—Japan.

It is some three and a half centuries since foreigners (Europeans) settled at Macao, near the mouth of the Canton river; and they have enjoyed regular intercourse with the Chinese for all this period, with no perceptible impression on China. It is inconceivable, the small effect the other nations have until recently exercised upon her; indeed it is only within the present century that this influence can be said to have made any impression at all. The reason for this is largely in the fact that the Chinese do very little

traveling even in their own country, generations following each other for ages in the same town. The customs and dialect become local, and the people of one province cannot converse with those of the next province, although possibly not fifty miles intervene. The written language is the same throughout the Empire ; but if we consider the many different dialects, and the closeness with which each separate community clings to its own habitation, the difficulty of spreading any influence is readily understood.

During my sojourn in the "East" I was naturally desirous to obtain all the information I could concerning the progress of the Chinese in that field of science in which I was particularly interested, but I was unable from lack of time, to extend my research much beyond the limits of foreign residence. Careful observation whenever opportunity presented, and inquiry of those resident among them, failed to reveal even the most primitive attempt at preservation of the natural teeth. I, therefore, believe that I am fully within the bounds of truth when I say that beyond certain remedies for relieving toothache, extracting, and an occasional crude attempt to supply an artificial tooth, or a few teeth, there is no knowledge whatever of dentistry among the hundreds of millions of Chinese.

In the treaty ports with the daily contact with foreigners there has naturally grown up in the minds of many of them, some knowledge of the medical and dental methods of the western world, and from the medical missionary. Many even of those living in the far interior, have come to appreciate the value and importance of foreign medical and surgical skill.

None of them are so ignorant of dental matters, however, that they cannot appreciate, in some degree at least, the distress and inconvenience of an aching tooth, and employ some agency for relief, it may be spiritual, medical or mechanical. It is the quite generally accepted idea with them that pain in a tooth is caused by the presence of a "worm" which has taken up its abode inside of it.

They are encouraged in this belief by the class of men who go about the city streets extracting teeth. These find it to their pecuniary advantage to cater to this notion, and to prove the truth of their assertion, it is their frequent habit after extracting a tooth where the imprisoned "worm" has been making things particularly lively, to break the tooth and exhibit the "worm" to the astonished victim and interested onlookers. I wish I could bring

before you a picture of an aspirant for dental honors as I first saw him at a little village a few miles out from Hong Kong. He was squatting by the roadside, in front of the shops on the main street, proclaiming in loud tones his skill as a "worm" and tooth extractor. (This I learned from a Pigeon English speaking native.) His outfit consisted of a wooden tray some two feet long, fifteen inches wide and perhaps three inches deep, elevated upon a stool. At either end of the tray an upright was fastened, and between these several wires extended upon which were strung hundreds of teeth. In the tray were perhaps enough more teeth to fill a peck measure, beside a number of bottles and paper packages.

I enlisted the aid of the friendly interpreter to find out about the bottles and ascertain what appliances he was using for extracting, there being no instrument whatever in sight.

He was shyness itself, but after much palaver he produced from that part of his clothing made famous by Bret Harte a rather large pair of ancient, much worn and abominably dirty pliers, of foreign manufacture. These, after some hesitation, he permitted me to take for examination, and I was conscious as I held them in my hand of a profound feeling of respect for the simple tool, the product of some humble European artisan, probably long dead, who in making it had toiled to a better purpose than he had ever dreamed.

In all probability either you or I would have discarded the implement as not retaining enough of its original usefulness to be of service in tack pulling, and, but for all the horribly abundant septic possibilities present, would have doubted that this was the instrument used, and according to his statement, the only one.

No amount of questioning elicited the least information regarding the other articles in his tray (the bottles and packages), a shake of the head being the only response to my repeated inquiries. Common report tells of a mysterious powder some of these men use in extracting teeth, a small amount of which is placed on the gum around the tooth to be extracted, when after waiting several minutes the tooth can be removed with the fingers.

After much difficulty and several years of waiting I finally succeeded in obtaining, through a Chinese acquaintance, what was *said* to be a specimen of this powder, and its analysis shows it to be composed of potassium nitrate, sodium sulphide and what

seems to be red sealing wax. That only the fingers are used in removing the tooth is true, the powder being employed simply to mystify, which it succeeds in doing thoroughly, deceiving many foreigners as well as Chinese, for I have frequently been assured by the former that the powder did the work. A wonderful degree of strength is developed in the fingers by long years of practice in pulling wooden pegs from boards. In Japan the boys are put to this exercise when quite young, and as a result pegs are easily withdrawn by them that we would find it difficult to remove with forceps.

As an object lesson in Chinese dentistry I coveted this outfit, and offered the man what was a large sum for it ; but he refused to sell. Then it was proposed to pay him his own price, including a good pair of forceps, but to no purpose ; he could not be induced to part with anything. It may not be amiss to speak, in passing, of the peculiar trait of the Chinese illustrated in this incident. It is characteristic of them that no matter how much they may wish to dispose of any article, how desperately they may be in need of the money its sale will bring, they invariably refuse to sell when openly approached with an offer to buy.

They have their customary way of conducting such matters, and with them custom outweighs in importance every other consideration, almost to that of life itself.

The preliminaries to a sale must be conducted with great discretion, for an axiom of much importance in China is, "The country villager is born perverse ; the more you wish to buy the more he is determined not to sell."

Suspicion is a national characteristic ; not as applied to one's neighbor solely, but each man suspects himself, or recognizes his own weaknesses, and in all trades except in shops and open market, where prices are fixed, the employment of an intermediary is necessary. I cannot dwell longer on this trait than to quote the Chinese adage, "If there are no clouds in the sky there will be no rain on the earth ; if there is no one to stand between, business will not be done."

For years I have been trying to get possession of the outfit of one of these Nomadic individuals, even enlisting the assistance of residents of interior cities, where I felt that the prejudicial conditions might not be so great, but thus far without success. I am hopeful, however, that the day may come when I shall make that

addition to my collection, and have the pleasure of exhibiting it to you. What I have stated is, so far as I have been able to ascertain, the sum total of the Chinaman's own unaided efforts on behalf of the natural teeth.

They make an indifferent attempt at supplying the places of lost teeth, the artificial being made of ivory or bone, shaped with a file and attached to the remaining teeth with brass wire. The effect in the mouth is often hideous beyond description. Where a single tooth is lost, an artificial substitute is shaped to fit the vacancy and forced to place, no retaining wire being used. When the space has enlarged until that piece is no longer retained, another and wider piece is made that will fit tight. This wedging operation is repeated until the retaining teeth assume such an angle that it becomes necessary to wire the piece in place. I have with me some specimens of this class of work, and appliances with which they were made, which you may be interested in examining.

The file, with its teeth cut only one way, is a very fair tool you will observe, rather coarse for such work, but it is marvelous how much they accomplish with just such instruments. It is of native construction and its temper is poor.

The drill is made from an umbrella rib, while the wire is doubtless of foreign manufacture.

In some of the larger coast cities are to be found a few Chinese practicing dentistry. "Alle same foleign dentist," they would tell you. Their knowledge of things dental is purely empirical, and has been derived from association with foreign dentists; either as assistant, or an attendant, whose duties were to receive visitors and keep the office in order.

During his tenure of office he had probaly permitted his sponge-like proclivities to operate with some freedom, and so had "absorbed" enough of the worn, or nearly worn out belongings of his master, to fit him out very fairly when he decided to set up for himself.

Two of these men I know to be possessed of a considerable degree of skill; one, practicing in Hong Kong, was for several years Doctor Roger's assistant, and when I first went there in 1886 was patronized by a number of the leading foreigners in preference to the only European dentist there at that time. The other who is now practicing in Shanghai was assistant to Doctor H. H. Winn for fifteen or more years before I joined him, and continued

with us until the time of Doctor Winn's death in 1890, thus enjoying a pupilage of fully twenty years.

Both of these men have fully equipped modern dental offices, furnished in one case with a Wilkerson high low base chair and fountain spittoon, and in the other with an S. S. White pedal lever chair. Each has a full equipment of White's instruments. All of these Chinese practitioners are patronized quite largely by a class of foreigners whose means will not admit of their going to the foreign dentist, such as merchant and naval seamen, soldiers (in Hong Kong) and many others. They are also doing a good work in educating their own people to some knowledge of dental matters, as many of the better class of Chinese go to them for both operative and prosthetic work. As each one of these native "tooth doctors," as they are called, has a small army of relatives and family connections who, like parasites, attach themselves to him, their value as educators is greatly increased, and I predict that it will not be many years before the foreign dentist in China will have Chinese graduates from American dental colleges to compete with.

A large and gradually increasing number of Chinese patronize the foreign practitioner. They are the higher officials and wealthy merchants who constitute a very satisfactory class of patients in many respects, but I must admit that I prefer not to work for them and did nothing to encourage their coming to me.

The directions in which they are satisfactory are, the absence of nerve and the ready promptness with which they unquestioningly pay their bills. Nerves, as we know them in the occident, do not exist in the Chinese. I never knew one to make the slightest movement while in the chair, no matter what the severity of the operation. The first experience I had with this nervelessness made a decided impression upon me. One morning during the early weeks of my China life, the assistant came in with the announcement that Mr. ———— was there, naming a Chinese gentleman, whom the records showed to have been a patient for several years. I gave instructions to have him shown in, and there filed in a splendidly attired Chinaman followed by three Chinese women, each bearing what appeared at first sight to be another smaller woman upon her back; when the burdens were deposited in chairs they proved to be daughters of my visitor, ranging in ages I judged from nine to twelve years, and carried, because their bound feet would not admit of their walking.

In perfect English I was requested to examine the mouths of the children and do whatever seemed to be necessary. Each in turn was carried to the operating room and from one to three temporary teeth removed from each mouth.

There was not a second's delay waiting for a mouth to be opened, not an audible sound, not a tear from either one of the girls from beginning to end of the operations. Nerves! Apparently there were none. Rev. Arthur H. Smith, in writing of "The Absence of Nerves" in his "Chinese Characteristics" says, "One of the most perfect exemplifications of the automatic nature of Chinese physical activity with which we are acquainted, is the process of malleting for a dentist. Those who have been compelled to submit to this form of torture, know how difficult it is in an occidental land to get a person to mallet, who shall deliver his strokes in an even succession, and of a uniform weight. It takes long practice upon a long line of victims, before anything like a steady average is maintained. Now watch the nearly automatic operation of the "boy" in the office of the first dentist toward which harsh fate drives you in China. The boy is a very nearly ideal machine, and he never knows that he is using his nervous system at all, as perhaps indeed he is not."

I am glad to add my testimony to the superior excellence of the Chinese assistant; as a malleter perfect, as a faithful attentive helper, unsurpassed. Always at his post, ready and quick to learn. If he does annex any of your old belongings, which is not unlikely, you do not feel like censuring him; it is done so gracefully and at such an opportune time, that you feel almost under obligations to him for relieving you of the necessity of disposing of the articles. My experience differs from that of many touching their honesty, for, during the years my "boy" was in my service I cannot recall an instance of an article being missing that was left in his care.

I have spoken of one assistant who was in the office for a period of twenty years; when I left China I turned over to my successor as part of my office belongings my "boy," (the head servant in office or house is known by that name regardless of the fact that he may be a grandfather) who entered my service eight years before, also the patriarch of my servant staff, the office coolie, who then was transferred to the fourth generation of dentists in that office; he being over thirty years in one situation, or what was virtually the same employ.

Since my return to America I have frequently been asked in various ways but with perfect seriousness, this question: "Are you not glad to be back again where you can enjoy the comforts of civilization and have respectable patients to work for?" The frequency of this inquiry leads me to believe that there is a very widely mistaken idea prevailing in the minds of many relative to this, and also to other than dental matters, in the far east; and that it may not be uninteresting if I introduce some description of the everyday life of the foreigner in Hong Kong, Shanghai or Yokohama. I particularize these places because it is only here that dentists reside, and what is true there is in a large measure true of the other cities where foreigners are living.

"Respectable patients to work for" and "comforts of civilization!" One would suppose that we worked for coolies, lived in miserable quarters and were obliged to subsist upon a diet of cats and dogs, to mention nothing worse. In what I have said I have given you some idea of the proportion of Chinese in my practice. It was small, but I presume quite as large as that enjoyed by my associates. The Chinaman we meet upon the streets of our cities is no more to be compared to the Chinese Mandarin or rich merchant in his costly apparel of silk and satin, than is the laborer shoveling dirt on the railroad near by, to be compared to the gentleman that comes to the office of any one here. Such a Chinaman as I describe is a respectable polite gentleman always; nor does he bring with him nerves enough for ten people, or beset you with a never ending flood of objections to this, that and the other thing, as too often is the case with our patrons in more civilized America. The clientele of the leading dentists in China would compare favorably with that of the best in any country on the globe; nobility, titled diplomats of European courts, ministerial, consular, and judicial representatives of all the principal nations, these, and their families, the merchant princes from Europe and America, with their families, the officers from the American and European men of war on the station, and hundreds of English speaking missionaries constitute a field of practice most delightful in its personality, and one that any dentist could feel honored in possessing.

With the exception of the missionaries, the foreigners in China are there either in Chinese government employ, in official relations with that government, or in trade, and reside only at the open, or treaty ports, and Peking. These cities are hundreds of miles apart and communication is only by water.

Their houses are large, airy two-story structures, built of brick, surrounded at both stories and on as many sides as possible with broad verandas.

Shanghai furnishes one of the most abundant markets in the world—one with which the most fastidious epicureans could find no fault.

To supply the dental requirements of China and Japan there are ten foreign dentists; those Chinese I have described; and a large number of native dentists in Japan.

There are two American dentists in Japan, both in Yokohama. The conditions for practicing in Japan are less favorable than in China, owing to the more intelligent competition of the natives, some of whom are graduates of our schools of dentistry.

The eight dentists who occupy the China field are graduates of American Dental Colleges and all but one are Americans, three of them are in Hong Kong, in two offices, and the remaining five in Shanghai, operating four offices.

When a foreigner in one of the smaller ports finds he can no longer postpone a visit to the dentist, he tells his "boy" to pack the luggage and they go to Shanghai, or Hong Kong, as the case may be for a week or fortnight. Sometimes the dentist does the traveling, going to the other coast ports, the Yangtsze River ports, or perhaps to Peking, for a month. On such trips he is the guest of some one at each port, setting up his chair where he can; often his host's dining room serves as office. Occasionally patients come great distances to consult you; one lady traveled two thousand miles, being four weeks on the trip, traveling afoot, horseback and in boat and steamer.

Without more than the usual amount of self-reliance, the dentist will not succeed in these remote points, for there is no dental supply house at his elbow to fall back upon, no society meetings for mutual help and suggestions; he must alone grasp every problem that is presented and solve it at any cost.

On one occasion while in Hong Kong, a Chinese official came to me, sent by a medical friend in Canton; his teeth were all right, but he had lost his left ear and wanted to know if I could do something for him, because, while so disfigured, it was impossible for him to enter the presence of his superiors. I was able to put him in presentable form and intended photographing him. His delight when he saw the restored ear was so great, however, that he

rushed for the Canton boat not waiting for the paint on the new ear to become dry, and that was the last I ever saw of him. Another case—that I failed with—was when a Mandarin at Soochow, some eighty miles from Shanghai, sent down by a friend requesting that I make him “plates for both jaws,” as his teeth were entirely gone. It is necessary to have a very extensive outfit for practicing in China; every instrument must be in duplicate to provide against breakage; gold plate and foil by the ounce, thousands of artificial teeth and quantities of every other article must be kept in stock. Even then without the greatest care something will give out, with the dental depot three months distant.

In my effort to give you some conception of the practice of dentistry in China, I have said nothing of the severe climate, the great heat during part of the summer and other features connected with life in that country. There is much more that could be said, but I will close with this word of advice to the younger men, don't decide at once that China is just the field you have been looking for and pack your little case of instruments and start for “Far Cathay.” If you have friends there, or can take a pocket full of letters of introduction it perhaps might be thought of; lacking them you could but make a dismal failure of the venture, for the field is fully occupied, and furthermore, the people are not of the changing kind.

THE RELATION OF GENERAL SYSTEMIC PATHOLOGICAL CONDITIONS TO DISEASES OF THE MOUTH AND TEETH.*

BY J. E. NYMAN, D. D. S., CHICAGO, ILL.

There is and perhaps always has been a tendency on the part of a large number of the members of our profession to pin their faith to their mechanical ability, to be wrapped up in it, to strive for and devote all their time and study to the perfection of it; seemingly forgetting that the other branch of our work, the diagnosis and treatment of the diseases of the mouth and teeth, is equally important and equally deserving of their thought and investigation. For upon the success of the latter is very often dependent the success of the structures reared by our mechanical skill; not that I would for a moment decry or belittle that ability, for as between two men, other things being equal, the one with the greater mechanical skill, will be by far the better den-

*Read before the Odontographic Society.

tist. Even among those who attach due importance to therapeutics and the study of pathology, there seems to be a great many who fail to appreciate that the mouth is a part of the human body, that it is well nigh as closely and vitally related to it as are the eyes, nose or the ears, that the influence of systemic derangements upon its tissues is often very apparent ; in fact, that they may be the causes, direct or predisposing, of some of the most serious and baffling diseases we are called upon to treat, or, at least, be such a source of aggravation that they render futile all our efforts toward a cure.

This failure to appreciate this relationship narrows and obscures our field of vision where we should see clearly and with wide open eyes, perplexes and puzzles us when we should be certain and sure, and may deeply humiliate us as after an uncertain diagnosis we are unsuccessful in our treatment, our promises to our patients remain unfulfilled as time goes by ; until we find their confidence in us is gone, and their faith in dentists in general severely shaken. For while we are uncertain of the cause of the disease and the aggravating conditions which may accompany it we are fighting it in the dark, groping and seeking to grapple with a foe that always eludes us until the clear light of knowledge enables us to bring it to bay and subdue it. Indeed, it has been almost wholly through the discoveries of the causes of diseases and the recognition of the accompanying conditions ; in other words, through the revelations of pathology that the marvelous progress of the last decade in medical and dental science has been made.

Fortunately for us men of keen, observing, patient minds have labored in this very field. Miller, Black, Kirk, Pierce, Barrett, Talbot and many others have given us much valuable information as a result of their careful, painstaking researches and experiments, but in spite of all the evidence they have given us the relationship is often hard to establish, evident though it may be to us, and conclusive and certain as we may be in our opinions ; proof positive is sometimes hard to find, and in this paper I would call your attention, at least, to certain associations of diseases in the hope that some day some one of you will finally be able to prove that that which may be, is.

In order to systematize I will first mention certain lesions and diseases of the mouth and teeth, and give the systemic derange-

ment, which may be the cause direct or indirect, or at least, when accompanying them, be a source of aggravation.

DEFECTS IN THE STRUCTURE OF THE TEETH.

Dr. Black and others have written upon and demonstrated the influence of systemic diseases occurring in early childhood, especially those of an infectious character and accompanied by a fever upon the permanent teeth then in process of development. It is simply a case of lack of nutrition. The builders are denied sufficient quantity of material with which to build, and faulty structures are the result, structures that give way early and easily. Scarlet fever, measles, chicken pox, diphtheria, cholera infantum, pneumonia, primary or inherited tuberculosis or syphilis ; in fact, any prolonged derangement accompanied by a fever or producing profound anæmic conditions will so affect the teeth then in process of development that when these are erupted we may find defective spots in the enamel ; sulci in which the enamel surfaces are not perfectly united ; or worse, spots entirely devoid of enamel covering ; or even worse still, whole zones of unprotected and exposed dentine. These teeth are, of course, predisposed and usually do fall early victims to the ravages of caries. Dr. Pierce has constructed a chart showing the extent of development of the teeth at the different ages in childhood, and by noting the position of the enamel defects when they are not too extensive, and referring to the chart one may very often closely judge the age at which the individual suffered from some very severe systemic disease, thus very conclusively demonstrating that the local defect was due to a systemic disease in childhood.

DEATH OF THE PULP AND ALVEOLAR ABSCESS.

The same diseases occurring in later childhood, between, say the ages of ten to fifteen, when most of the permanent teeth are erupted, but are not fully developed and foramina are large, are very apt to cause the death of the pulp through arrested nutrition or atrophic neuroses, and as a sequence, follows alveolar abscess, which may be a grave matter indeed, as at this age the tissues of the body usually readily permit the infiltration and diffusion of septic material which is very likely to result in septicæmia, the dangers of which every one knows and fears.

CARIES OF THE TEETH.

Extensive and recurrent caries is oftentimes associated with

disorders of the stomach. Probably the hyperacidity almost always present in derangements of that organ affect the saliva rendering it somewhat acid and more readily fermented, creating conditions certainly favorable to the rapid and extensive action of caries. When patients sometimes tell you that their teeth used to be so soft and decay so readily, but that of later years they seemed to have grown harder and suffer less from caries, you will usually find upon questioning them that they used to suffer a great deal with some form of stomach trouble, but that for some time past they have been free from it ; and as Dr. Black in his recent experiments has demonstrated, that there is very little difference, if any, in the composition, density or structural strength of a sound tooth and a badly carious one, it is pretty certain that the teeth grew no harder, but that the external condition improved upon the disappearance of the stomach troubles, and the fluids of the mouth no longer so favored the action of caries.

Catarrhal rhinitis and pharyngitis have also been noticed in connection with rapid and extensive decay of the teeth probably due to the degenerate condition of the nervous system. Some one some time ago advanced the theory that inasmuch as tuberculosis produced caries of the bones, and as the teeth were more like bone than anything else, that perhaps decay of the teeth was nothing more nor less than tuberculosis of the teeth. He gave no facts or reasons, so that it was merely a speculative theory ; and inasmuch as the tubercle bacilli is only found in the cavities of the teeth when it is also present in the sputum, and the person is already suffering from general tuberculosis ; and in the majority of cases of caries they are not to be found at all and the patient shows no symptoms of that disease ; there is no foundation whatever for any such theory. Tuberculosis does manifest itself in the mouth but not in that way.

Pregnancy seems to predispose the teeth to decay in a very marked manner. How, we know not. But as there is almost always marked derangement of the digestive system for several months during that period it is probably due to the perversion of the fluids of the mouth and stomach, and to the nervous irritability and degeneracy that accompanies it, which perhaps alters the fluids secreted by the mucous glands in the gingival portions of the gums, so as to render them acid and be the cause of the gingival decay so common to that condition.

STOMATITIS AND ULCERATIONS OF THE MUCOUS SURFACES.

These may be purely local, but they are also very often the manifestation of syphilis and tuberculosis, and when such cases will not yield to local treatment alone, search should always be made for indications of the above mentioned diseases in the general system.

INFLAMMATIONS OF THE PERIDONTAL MEMBRANE AND
PYORRHŒA ALVEOLARIS.

The most prominent systemic condition at present associated with this as either its cause or as an aggravating condition is that of lithiasis. The gouty condition or the uric acid diathesis, as it is called ; and many indeed are the cases in which it does seem the cause. Our bodies are, so to speak, great chemical laboratories, into which daily almost the same kind and amount of material is sent, but how the products may differ. Here, for example, is a man perfectly normal and healthy in outward appearance, and yet in the urine, albumin, which should not be there, is found. Place him beside another man, feed them the same food, in the same amount, make their daily life the same ; keep this up day after day, week after week, month after month ; yet in the products of one human laboratory will still be found a fluid with albumin in it, and of the other one, without a trace of it. The organic chemical changes and reactions are complex and very hard to trace and determine. It does not always follow that because there is or is not uric acid found in the deposits upon the teeth that gout is or is not the cause of the pyorrhœa. These facts alone are not sufficient proof. We must have corroborative evidence to prove it one way or the other. Uric acid is always present in the blood and in the urine in a certain quantity, which is normal. The functional disorder of the kidneys, or more especially of the liver, may by deranged elimination cause an abnormal quantity to collect in the circulation and manifest itself in some of the phases of gout ; which are varied and manifold. It has been demonstrated that the deposits upon the teeth, both salivary and serumal, even when the teeth are free from pyorrhœa, usually contain traces of uric acid, but there are cases of pyorrhœa in which the deposits show no traces of it whatever ; and it is a mistake to try to prove that gout is the cause of every case of that disease, and much time and energy is being daily wasted in the attempt to do so ; for beyond ques-

tion there are other systemic derangements which tend sometimes to produce almost the same local condition. Albuminuria or Bright's disease may be a cause predisposing or direct of this disease, or if only by chance accompanying it, it presents an almost insurmountable obstacle to the successful treatment of it. The same is also true of diabetes.

Tuberculosis, especially that form which is known as tubercular osteomyelitis or tuberculosis of the bone, as it is popularly known, will almost invariably sooner or later develop a form of this disease with sometimes little or no deposit which progresses very rapidly, is unchecked by local treatment alone, does not cease with the extraction of the teeth, but will continue in the periosteum of the jaw bone unless systemic treatment be instituted. As this form of tuberculosis attacks the periosteum of the bones, it is little wonder that it also attacks the pericementum of the teeth. In these cases there are always symptoms to be found which indicate that there is general tuberculosis in connection with the local manifestation.

The writer recalls one case, a young man, of Swedish nationality, who suffered extensive pyorrhœa which refused to yield to frequent and thorough treatment. He complained severely of rheumatism in the leg near the hip joint. There was also a swelling and hardening of the cervical lymphatic glands. Suspecting general tuberculosis, I referred him to a physician who sent him to the hospital, where he was subsequently operated upon and was found to be suffering with tubercular osteomyelitis of the shaft of the femur. The glands of the neck were also found casefied. After the operation constitutional treatment was instituted with marked improvement in his general health and upon local treatment again being applied, the pyorrhœa was checked and has remained so for over three years. This would seem to prove conclusively that if the general tuberculosis were not the cause, it was an aggravation which prevented successful treatment of it.

Syphilis, if neglected, may during the secondary and tertiary periods, also bring about a local manifestation with very little deposit, but causing extensive loss of the peridental membrane and involving all the teeth, and as in the case of tubercular pyorrhœa, refusing to yield to local treatment. Cardiac derangements have been mentioned by some as being the cause of peridental inflammation, but little attention has been directed toward them, and I have never seen a case where they were so associated.

Dr. Sudduth, now of this city, sometime ago in a splendid article upon this disease, said that it was a catarrhal condition caused by and associated with general catarrh of the nose and throat. His arguments were good, and from the cases he reported, I have no doubt that it is true in many instances. The fact that mercury and the iodide of potassium taken internally, after passing through the digestive organs and entering the general system, will cause the peridental inflammation, which is but the first step in the direction of pyorrhœa, seems to clearly demonstrate that this disease may be largely, or perhaps entirely, the result of a systemic condition. One peculiar thing about this condition of salivation, as it is called, is that if during the use of these drugs the patient partakes of acid drinks, or takes cold, the peridental inflammation appears much sooner and in a more marked manner.

Dr. Talbot, of this city, seeks to explain this disease as a result of both a local and a constitutional cause, giving special prominence to neurotic derangements, and degeneracy of the system in general. The evidence which he has collected from his researches in hospitals and asylums for insane, prisons and houses of correction, indicate that it is a very prominent factor in this disease. It certainly seems advisable in every case of true pyorrhœa to have the urine examined for lithiasis, albuminuria and diabetes. Examine the cervical glands of the neck, for tubercular casefications, inquire in regard to the deformities of the spine or presence of hip joint disease, and when you feel at liberty to do so, as to whether the patient has ever suffered from infection of syphilis, or has been threatened with paresis or insanity; for even if we are finally forced to admit that these systemic diseases are not the cause, they are nevertheless to be carefully searched for and considered, for they constitute at least an aggravation which spurs on the pyorrhœa to its worst, and renders local treatment of no avail without systemic medication.

I made use of the term true pyorrhœa to distinguish it from what some writers have called psuedo pyorrhœa, which is a purely local affair, and is nothing more or less than an extensive deposit of calculus, serumal or salivary, or both, combined with many microbes and general filthiness of the mouth.

Now, as we listen to the theories and the evidence given in turn by the men who hold different views as to the cause of this disease, what is to be our conclusion? Certainly, each of them

has been profoundly impressed by and has carefully considered his theory before giving it to the world, and has had the facts at hand to back it up, and which have forced his conclusions upon him. Is some one of them right, and all the rest wrong in spite of their observations and reflections?

Is it not more likely that all were right, and that pyorrhœa is an inflammation of the peridental membrane, inducing deposits of an irritating nature, resulting in the destruction of that membrane and due to varied constitutional disorders in conjunction with local irritation?

That is my view, and I like very much the suggestion of Dr. Rhein, of New York, that hereafter we distinguish, and refer to the forms of pyorrhœa as lithiatic, diabetic or tubercular pyorrhœa, etc., as the case may be.

EROSION.

We are very much at sea in regard to the etiology of this condition. The best theory is that it is due to some form of acid secretion, secreted and acting in some manner unknown to us.

Dr. Darby and Dr. Kells assert very positively that the uric acid diathesis has something to do with it, and I have no doubt it may have.

Dr. Talbot thinks it is rather an atrophic neurosis due to nervous derangement, and perhaps he is right.

While we are so uncertain as to what it is we must not condemn any one who presents a theory so long as he is rational about it, and has any evidence at all to confirm it.

In conclusion, I would say that this subject of the relationship between the system in general and the parts local; is attracting the attention of some of the keenest minds in our profession. Almost every new number of the different magazines has an article on some phase of it, and I believe that it is a field of research where we will make great progress; and that the day will come when we will be able to accurately prove the various relationships, accurately diagnose them, accurately prescribe for them and get accurate results from the combination of systemic and local treatment; and may that day soon dawn.

REFLEX FACIAL NEURALGIA.

By T. H. MORRISON, M. D., D. D. S., ST. LOUIS, MO.

After reading and hearing articles without number often repeated, on subjects I consider worn-out, such as filling roots, etc., etc., it has occurred to me that very *little* attention has been given to facial reflex action.

Several cases of apparently idiopathic neuralgia came my way as a last resort, after long continued treatment by the physician or neurologist. I did nothing at all mysterious, simply removed the exciting causes, all done in a very short time and followed in nearly every instance by absolute and permanent relief.

How much better if some one of our calling had been consulted and examined the oral cavity and contents, instead of the physician asking "Are your teeth all right?" and then proceeding with his big prescriptions, many of them doing more harm than good, by the way.

Physicians treat symptoms as a rule, but (as a learned judge of Missouri terms us) "tooth carpenters" spend their time in hunting for and removing causes of pain and disease.

In a genuine case of reflex neuralgia one might prescribe quinine, iron and arsenic in their various forms forever to no avail.

Medical books say in regard to the etiology of neuralgia that malaria, gout and anæmia are responsible, and little more than mention reflex action and decayed teeth.

I know there are some neuralgias (called idiopathic) but many especially of the second and third branches of the trigeminus, are reflected pain from the teeth, some from growth and diseased bone, growth in the nasal cavity and middle ear, and eye strain. However the teeth are accountable for over one-half of all severe reflex neuralgia, in my opinion.

Webster says, "Neuralgia is a disease, the chief symptom of which is a very acute pain exacerbating or intermittent, which follows the course of a nervous branch and its ramifications and seems therefore to be seated in the nerve." That last was well put and protects Webster nicely for all times, for we know that things are not always what they seem.

Abnormalities in the condition, number and eruption of the teeth do cause pain elsewhere, and chiefly along the branches of the fifth pair of cranial nerves and their ganglionic connections.

We see fewer cases of neuralgia than we should, because the medical practitioner does not know that the most acute intermitting facial neuralgia is often caused by the formation of a pulp stone or nodule inside the pulp chamber of a tooth; also that neuralgia is the subjective symptom of a growth of pericementosis or exostosis. They know about growths of bone and swellings causing pressure and exciting inflammation along the whole nerve sheath, but what do they know about these delicate and difficult subjects for diagnosis in relation to the teeth.

I tell you dentists could teach them a thing or two, and save suffering humanity from shotgun prescriptions, and the too free use of somniferous drugs, as well as surgical operations, such as neurectomy, neurotomy, etc. I only mean by this that such things are done too hastily and without proper consideration.

When I do not know the cause of anything, I do not take it for granted that no one else does, but am perfectly willing to have any one's opinion, and always seek it when in doubt.

Shall I speak from observation, recalling several cases, one treated by a celebrated neurologist for over a year, and who by chance came to my hands. There was not a cavity of which either the patient or the physician knew, in fact the enamel walls had not broken down. I did about fifty dollars' worth of work in nothing but amalgam fillings, so you can imagine how many billions of nerve endings were irritated. The case was cured permanently.

Another was operated upon by an equally renowned surgeon, and the superior dental nerve removed entirely; neuralgia still prevailed in as bad, if not more terrible form. After many months one lone upper molar, which had roots each twice the normal size was extracted in our office. This being an extensive and aggravated case of pericementosis. Patient has not been so free from facial neuralgia for years.

To sum up, any irritation of the millions of nerve fibrillæ in the teeth and exposed necks of teeth, is amply sufficient to start an inflammation, (if it be inflammation as I think it is) extending along the course of the nerves to the larger trunks, where the blood vessels of the nerve sheaths are proportionately large, and may also extend through the ganglion to the sympathetic system.

This paper could be continued indefinitely, with its minutiae, but I merely wish to start the ball rolling on this very important

though much neglected subject, of which we see little or no writing in the dental journals, and the weak point in the education of our medical brothers.

Since this paper was written I hear there was an article or two on neuralgia recently in the dental journals.

ALUMINUM*

BY DR. E. C. GOLDTHORPE, CHICAGO, ILL.

In order for an artificial denture to best serve its intended purpose it should possess durability, strength, adaptability, be cleanly, transmit thermal changes rapidly, be a nonirritant and, of course, to look well, would enhance its agreeableness, and materially add to personal appearance. The great strength of aluminum alloy and the readiness with which it can be cast directly onto teeth causes it to be much superior to rubber and nearly equal to gold for partial plates, the latter heretofore being unequaled in all respects for partial artificial dentures. The most difficult feature in swaging metal plates is to secure perfect adaptability, especially in those cases where the undercut is present to any great extent, but when the metal flows over the model and enters every groove and pin point, the undercuts cease to be perplexing and become a fast holding comfort.

Of course there must be some shrinkage in a metal changing from a heated to a cool condition, but the model during the process of casting is also expanded by heat, which counterbalances the metal contraction, especially if the metal has not been heated much beyond the necessary temperature. Close observation will soon teach one when the metal is at a proper heat for casting.

Nowhere in the whole universe does the proverb "cleanliness is next to godliness," apply so forcibly and unconditionally as in the oral cavity. It is the portal for the reception of all the delicacies of taste and nutrition. From here the sacred and pathetic words are wafted to our ears, but let the ever alert olfactory nerve catch one whiff from an ordinary cared for rubber plate and the words will fall as flat as the "tintinnabulations from an automatic mouth."

Dental rubber is composed of rubber gum, which is a vege-

*Read before the Hayden Dental Society.

table product, with varying quantities of sulphur and mercury. During the process of vulcanizing H_2S is given off and either into these tiny vent holes debris and secretions find their way, or the vegetable base absorbs them, producing anything but a palatable effect.

You may say that patients can by care greatly overcome this unpleasant condition and, if they are not concerned why "cast pearls before swine?" At present we have no pearls to throw away, but we can always lend a helping hand to humanity and will be so doing by giving them a plate which will not become contaminated, but be as easily cleansed as a golden spoon.

Rubber is a nonconductor of thermal changes and only too often have we seen the raw looking palate and painfully listened to a story of a sore mouth and sometimes an aching head. Not only do rubber plates often cause inflammation of the mucous membrane, but the undue heat prevents constructive metamorphosis and as a result the alveolar process shrinks away until the patient cannot wear a plate at all. While undue shrinkage of the tissues occurs in some cases when metal plates are used, it is not so frequent by any means and seems due to a constitutional defect.

Metallurgists claim that aluminum transmits thermal changes as rapidly as silver, and this being a fact, we could not expect heat to be retained until it produced irritation or undue absorption.

Besides the good qualities of an artificial denture the amount of labor and cost of production is worthy of consideration. So simple and easy, though exacting, is the process of producing cast aluminum dentures that any skillful and conscientious dentist will meet but little trouble.

Before one becomes thoroughly familiar with every detail, some essential point may be overlooked and a failure result, but after getting thoroughly familiar with the work failures need not be expected more often than in any other high grade work.

Regarding the labor and cost of artificial dentures Dr. L. P. Haskell once said: "The introduction of vulcanized rubber as a base for artificial teeth has enabled many people to obtain artificial teeth who would otherwise have been deprived of them. At the same time the *modus operandi* of the work is so simple, it has enabled a multitude of quacks to set up in business who have not the remotest idea of how a set of teeth should look in the mouth, and the result is we meet at every turn people whose mouths are a constant reminder of rubber plates and cheap dentistry."

It is beyond question that gold and continuous gum plates come the nearest to approaching the ideal, when the cost is not considered, but a great many cannot meet the expense, and aluminum comes in as an improvement on rubber and a modifier of expense.

Aluminum helps us to raise the standard of dentistry and as our standard of knowledge and workmanship is raised will the idea of a nasty horrid plate, and the associating of the name "corn doctor" and that of dentist disappear from the minds of the public.

The masses of the people are gradually learning the necessity and advantage of dental surgery. Many are well enough informed on the subject to speak intelligently and demand the best services which their means will permit.

But new fools are born every day and these people hold high the banner of quackdom and like working with a willing tool of satan's, do much to harm their and our welfare.

The higher the grade of workmanship the more difficult the work to perform, and the more artistic and serviceable the article, and the greater the chasm between scientific dentistry and quackery.

We must cause in the people a desire for a more artistic, skillful and scientific kind of dentistry, and by so doing strike the telling blow at the gabbling, advertising and bungling quack.

EARLY DIAGNOSIS, AND IN BRIEF, THE TREATMENT OF TUMORS OF THE JAW.*

BY H. H. SCHUHMAN, M. D., D. D. S., CHICAGO, ILL.

It was with great pleasure that I accepted the very flattering invitation of your worthy executive committee to write a paper on some surgical topic for the purpose of reminding the profession that our line of study and scientific pursuit includes something more than filling and extracting teeth. The subject which I selected is one in which I thought all would be interested, and one whose importance is easily appreciated. The difficulty of telling all I thought important enough to tell in the short time allowed for the reading of this paper, I did not realize until I got into the subject more deeply; I therefore at times will have to treat even important matters of interest very briefly, and beg for your indulgence.

*Read before the Illinois State Dental Society.

The word tumor, as you are all aware, signifies swelling, and yet in referring to swellings usually characterized by tumors, we have in mind distinct localized growths. Let us for the moment forget the various classifications of tumors found in general surgical literature, inasmuch as we are at the present time particularly interested in the ultimate course and destiny of these growths, and consider them from a standpoint of their malignancy or innocence.

Occurring in the jaws, it is safe to say that any tumor which by local and general disturbance can endanger life is malignant. It is unfortunate for the student that the various surgical writers do not seem to agree on the malignancy of various tumors. Most text-books classify them into innocent, malignant and semimalignant tumors. In the first class, of course, they only include such as are capable of creating none but local disturbances, where there exists for some reason an excessive growth of tissues very like that of the affected part from which they spring; for instance, there may be a localized growth of bone or osseous tissue, an osteoma of cartilage, or chondromous tissue, a chondroma, of fibrous tissue, a fibroma. These tumors imitate exactly the type of tissue from which they grow. They do not produce any serious changes in the surrounding tissues excepting by pressure and tension. They do not impress the system unfavorably any more than that they are generally annoying. By their location they may interfere with proper mastication and deglutition but beyond this are harmless. On the other hand, there are tumors which are not content by simply occupying part of the jaw, but which dig down and grow into the surrounding tissues; not satisfied in merely crowding the tissues before them, but saturate them with their poisonous elements, invading and destroying them, and through the blood disseminate their infection, setting up infectious tumors in the lungs, the liver and other parts of the body, until the patient finally succumbs to their exhausting influence.

As cases present themselves we find all grades of infectious tumors. Some grow very rapidly and without much loss of time lead to horrible ravages locally, and cause general infection; others slowly take years, still they all accomplish the same end, they all kill.

The term "semimalignant" tumor is misleading. A growth may present itself which does not cause rapid destruction or violently invades the surrounding structures, and still the step is

in that direction. It means death ultimately, but slower death. In some text-books we find cancers or carcinomas classed as malignant and under the head of semimalignant we find the tumor called sarcoma. Sarcoma, as you all know, signifies flesh, but do not think for a moment that these tumors are made up of muscle tissue. They are constituted of exactly the same kind of cells though, which go to make up muscle tissue in the embryo, what we call embryonic connective tissue cells. Let us consider the sarcoma for a moment. We find there are three varieties. One is made up of round cells, another of oat-shaped, called spindle cells, and a third is composed of irregular, very large round cells, containing in their interior a minute nucleus, called giant cells.

Now, despite the fact that sarcoma is called semimalignant, the round celled is equally, if not more malignant than carcinoma, and even the spindle celled variety may exhibit most malignant attributes, the most innocent of the three being the giant celled. It is apparent, therefore, that in order to make the subject more clearly understood we should speak of tumors as being innocent or malignant, the degree of their malignancy being of secondary importance. One important distinction between malignant and non-malignant tumors is made evident by the result of their treatment. Innocent growths once thoroughly removed do not return. This is not so with the malignant, from which microscopic cells have already forced entrance into surrounding tissues far beyond a point apparant to the naked eye and we will find them recurring even after the most generous removal.

It will not be possible in the brief time allowed here to enter into consideration of the peculiar features of each form of tumor, but I think it is sufficient to point out the distinguishing symptoms of innocent and malignant tumors, to study their cause and emphasize the need of early appreciation of their character and the necessity of early treatment.

Before entering the study any further it is advisable to call your attention to the fact that many of these tumors find their origin in the diseased condition of the gum secondarily invading the jaws, others to the contrary are located on or possibly in the body of the bone. Occurring in these different sites their ultimate course differs widely. Owing to the different relations of the two maxillæ to surrounding parts the greatest difference will make itself apparent in the malignancy of tumors originating in the upper

or lower jaw. Let us first consider tumors in the light of their location. The gums may be subject to a general thickening called hypertrophy, and right here, you will find how deceiving some of these growths are. True hypertrophy springs from the periosteum of the alveolus proper, and while therefore but a simple enlargement may be visible the condition will yield permanently to nothing short of removal of the alveolus. This enlarged condition of the gum may occur as a limited hypertrophy due to pressure of poorly fitting artificial teeth. This is especially true in elderly people wearing such artificial dentures, for at their time of life the tissues respond quickly to any irritation.

Another instance of a tumor classified more justly as a gum tumor is found in innocent growths springing up between the teeth with very thin necks and bulbous ends. These polyps are readily removed by a wire loop or the cautery. This reminds me of some of the peculiarities in the growth of these polyps. I remember a lady whom I observed during three different pregnancies, each time there appeared a series of well-defined tumors between the teeth along the whole free border of the gums, bleeding freely on the slightest irritation. These vascular tumors can be readily tied off or even removed by the finger nail. The hæmorrhage occasioned by the latter procedures is readily checked by the application of mild astringents. These are two forms of tumors in the gums, which on account of their simplicity and their frequent appearance, prompted me to name them first.

Let us now consider a class of tumors much more serious, although their name does not imply it. I refer to epulis. There are two kinds of epulide tumors; the one is firm, the other is soft. While the word epulis literally means a growth upon the gum, let me state right here that the name is a misnomer, inasmuch as you will find that tumors classified as epulide tumors are growths which, while they appear in the gum, have their original seat in deeper structures. The firm variety presents a dense structure, not however homogeneous throughout. They are firmly connected to the alveolar border, springing indeed from the very covering of the bone, the periosteum. This variety has not only bone as its base, but small independent collections of bone will on examination be found in its different parts. This tendency to organization into the bone is peculiar to sarcoma, and in fact is one of the essential characteristics of that kind of tumor formation. Soft epulis, is

composed of very succulent giant cells which readily break down and ulcerate, assuming a very angry and malignant appearance, strongly suggesting carcinoma. It is impossible to outline the extent of invasion into the jaw occasioned by these tumors. They are at their very beginning so intimately associated with the bone that it is at no time possible to say absolutely that they are gum tumors, and this very fact marks their malignancy. It is this unrestricted growth that is typical of malignant tumors. We cannot define their outline, they present neither a well-defined neck or border, while they may occasionally strongly simulate innocent tumors by apparently exhibiting a slender pedicle, but the surgeon soon finds on removal down to the bone without including the periosteum, a recurrence of a new growth from the same site. Epulis may be excited into growth as a result of irritation from decayed teeth or retained root stumps. It is said that they are encountered in women more frequently than in men. Professor Heath seeks to find reason for this fact that women shrink from operative interference oftener and will bear pain, like a toothache, longer than men. Besides that, they are liable to conditions in life under which operative interference is considered unwise, conditions to which men are not at all liable (I refer to the period of pregnancy and lactation).

Left to itself epulis may attain great size and produce considerable deformity. Despite the fact that epulis signifies growths upon the gum, please allow me to repeat that it is necessary to appreciate the fact that it is a growth implicating more than the soft tissues. Removal therefore, without including part of the bone means sure recurrence. For the purpose of removal I believe a strong Liston bone forceps and our surgical engine are the best instruments. The free hæmorrhage following is most effectually controlled by the Paquelin thermo-cautery. Operations calculated simply to gouge out or scrape out the affected surface are not sufficiently radical. Dealing with a tumor of malignant character it is always better to remove too much than not enough of the suspected tissue. A tumor bearing resemblance to epulis is often found on the hard palate, and likewise possesses malignant attributes, therefore should receive summary treatment. Statistics show that most epulide tumors are curable, and that they are likely to occur at all stages of life.

A more serious affection of the gums and one to which I wish

to call your attention, as dentists more particularly, appears in a much more innocent garb, a mere ulcer. A sore appears, perhaps awakened by some carious tooth which does not heal kindly, exhibiting a tendency to extend, the borders become hard and thick and the base adheres to the bone beneath, this is cancer. Bone is never primarily the seat of carcinoma or cancer. This broad assertion was first made about thirty years ago. German pathologists at that time held up cancers on the upper jaw as examples, positively disproving such statement, but we now know that there are but two locations in the superior maxilla in which carcinoma is ever encountered. The first begins as above indicated on the gum, the second in that cavity known as the antrum of Highmore; as you know both the covering the gum and the lining of the antrum is made up of varieties of mucous membrane, and it is in this tissue that cancer begins to grow, not in bone itself, each case starting not as a distinct tumor, but as an ulcer eating its way into the bone. Upon the gum a sore forms, presenting thickened edges and by its firm immovable base, its infiltrating features, its tendency not to heal under treatment and possibly pain already of this stage, show its malignancy. Dentists especially cannot have this too strongly impressed upon them, that when a recent ulceration of the gums shows no inclination to heal after judicious treatment of a week or ten days, it should receive prompt surgical attention. If neglected we must anticipate bone invasion. This invasion becomes further evident by the loosening of the teeth, and even at this juncture radical operation is quite certain to be successful. Of course, we must again cut wide of the diseased surface and be thorough in the extermination of the affection.

Just here it would perhaps be wise to consider for a moment carcinoma as it originates in the antrum. As previously remarked carcinoma of the jaw in its beginning is not manifested by swelling and its growth in the antrum more particularly illustrates this fact. Long before any swelling becomes apparent, the disease has not only undermined the maxilla but has spread in every possible direction. In persons of advanced years the first sign may perhaps appear in a violent toothache, a decayed tooth or stump is removed, and from the resulting cavity pus is found to discharge, the toothache remaining unrelieved. If the dentist will pass a probe up into the sinus of the antrum he may discover a

softened mass of dead bone and should be particularly guarded not to mistake the condition as a case of necrosis as I have seen done. If the removed root be carefully examined a soft slight growth may be seen attached to it; still, if even at this time the growth is not yet recognized, you will soon find the same fungous tissue growing out of the socket from which the tooth had been removed, or perchance by this time fistulous openings may have appeared on the hard palate or in the nostril through which fetid pus is discharged. To illustrate the various ways by which carcinoma may first present itself, I wish to cite Professor Kuster, of Berlin, who calls attention to another train of symptoms which he had observed in this connection, which were a severe toothache and pain in the jaw, assuming the form of trigeminal neuralgia, in conjunction with which there had appeared persistent nose bleeding not accounted for by any existing nasal disease. He believes that the joint appearance of these symptoms though there be no external evidence of swelling, fully justifies the making of an exploratory incision down and into the bone, and he claims that he has never failed to find the antrum in these cases in a state of cancerous degeneration. Professor Whitmarsch also reports a case where the appearance of a fungous mass in the nares accompanied by a profuse nasal discharge led to suspect cancerous degeneration, but in which case the true nature of the disease (carcinoma) was not made evident until revealed by a post-mortem examination.

You see by this that the various symptoms of cancer in the upper jaw concealed its true nature in the beginning, the growth progressing insidiously and except to the most watchful eye cannot be recognized until it has led to extensive destruction of the bone, not perhaps until it has opened into the cavity of the mouth, nose, or orbit, all within the last few weeks and already beyond cure. Professor Butlin removed within seven weeks after the first manifestations of the disease a carcinoma where he found not only the bone entirely destroyed, but sinuses burrowing into all the neighboring muscles. Under these circumstances it is evident that the most thorough removal of the upper jaw is totally inadequate to control the disease, if it is already advanced so that it can be recognized by external indications. Our only safety lies in the very early removal of the entire jaw before the disease has extended to any appreciable extent. To disclose the existence of a malignant disease which so cunningly conceals its presence, it is evi-

dently necessary to examine not only the mouth but the nose, the orbit, and indeed, even the throat, when anything of the kind is even suspected, and will require the combined efforts of the dentist and surgeon. The dentist finds the suggestion of Professor Heath most valuable, that the attachment of any growth to the roots of extracted teeth should excite their suspicion of the presence of serious disease in the bone. Any such mass should be subjected to microscopical examination in order to determine its true character.

Innocent tumors of the jaw may best be divided into two varieties, the hollow and the solid. To the solid I have already referred several times, and I wish to say but a few words on those known as hollow or cysts. Dependent upon the site and manner of formation, cysts are known as simple, dentigerous and multilocular cysts.

Simple cysts connected with the ends of roots of fully developed teeth may be so small as not to awaken even suspicion of their existence. When they attain greater size they are recognized by their slow growth, their localized character, and particularly by the gradual thinning of their covering, which at last becomes so attenuated that it crackles under slight pressure of the finger, and is painless. Dupuytren thought that the cysts are more frequently found in connection with upper canines than with any other teeth.

Dentigerous cysts are awakened by the irritation of an undeveloped tooth, when on account of misplacement, inversion, or some other reason, teeth do not attain their maturity. The first appearance of a localized expansion of the jaw exhibits no marked characteristics to distinguish it from a simple cyst, even from a solid tumor. It is found difficult to differentiate a dentigerous cyst until with time the walls grow thin and bend under pressure; possibly, until finally by the absorption of the entire bone covering. Of course, in all such respective cases search should be made for any absent teeth which had not been extracted; and the fact that supernumerary teeth may be responsible for these cysts should not be overlooked. To effect a cure a simple incision into the cyst wall and to evacuate the fluid contents will not be found sufficient, such an opening speedily closing again. In these cases it is necessary to remove part or possibly all of the anterior wall, cleanse out the cavity thoroughly, remove the irritating tooth or substance, whatever it may be, and allow the cavity to fill up by granulation.

A word yet in regard to multilocular cysts. They are not a direct result of dental irritation, but are due to an ingrowth of the epithelium covering the gum. However, indirectly it may be said that also they are caused by dental irritation, inasmuch as the ingrowth of epithelium is produced by the irritation from carious teeth. They are usually found in the lower jaw, and if left to run their course are apt to attain great size. As the name implies, they are composed of a collection of cysts, being separated from each other by thin bony walls. As landmarks in diagnosis the fluid contents, well-defined outline, slow growth and absence of pain are the ones most important to remember.

The solid outgrowth of bone and cartilaginous tumors are recognized by their slow growths and extreme hardness, freedom of pain and well-defined margins. Their removal simply requires exsection with a saw at the point of attachment to the bone, and no recurrence need be feared. A variety of cartilaginous tumors is known to grow from between the plates of the lower jaw, and this leads us once more for a moment to the consideration of sarcoma, in order to throw more light on the difficulty of diagnosis. I will refer back to them for a moment, with your kind indulgence. Carcinoma, as already said, springs from a surface covered or lined with skin or its substitute epithelium. Sarcoma, though, originates in any connective tissue structure, and to this class belong bone, muscle, tendon, and in fact as far as the jaws are concerned, every part but the thin membrane covering the surface of the gum, and lining of the cavities in the upper jaw. It is evident, then, that sarcoma can spring from any part of the jaws proper. In fact, all malignant tumors originating in the jaws and not from the surface are sarcomata. Reference has already been made to the different varieties of this tumor formation, but I think a further short classification will aid in making things more plain. When in the lower jaw sarcoma is found arising from the periosteum or surface of the bone it is termed subperiosteal; and when deep, from between the plates of the bone, it is known as central. I have already spoken of the one form, the superficial or subperiosteal sarcoma, which is the one interesting us mostly, usually termed epulis, and which when originating from the body of the superior maxilla, is a disease of most malignant type. It is a growth of more or less organized fiber, cartilage or bone; one that usually involves the body of the bone, growing rapidly, attain-

ing great size, spreading into the muscles, recurring speedily after removal, and if it has once begun to break down and ulcerate is soon followed by infectious tumors in other situations in the body, wherever the circulation may find a convenient place to deposit some of their infectious material, as is often seen in the lungs or liver. As to central sarcoma, the lower jaw is more frequently the seat of this variety than any other bone. The central sarcoma is less likely to infiltrate into the surrounding structures than the other, and may remain shut up between the plates of bone for considerable length of time ; this class bearing a striking resemblance to innocent central cartilaginous growths such as before mentioned. As a rule they are more innocent, or more likely to remain dormant than the subperiosteal variety.

If a growth springs up which is simply a multiplication of cells, being a counterpart of the tissue from which they grow, for example, in bone, cartilage or fibrous tissue cells of the same kind are reproduced as fully matured types of these tissues, we would have as results tumors which are truly osseous, cartilaginous, or fibrous ; but if instead, the cells do not mature, but remain in their embryonic state, this embryonic tissue growth is a sarcoma. There may be parts of this tumor which may mature so that at some points in it collections of true bone, cartilage or fibrous structures may be found. In some, the organization into fiber is so marked that the tumor may become quite hard ; in others, the cells are mostly of the embryonic type, and the growth consequently remains soft. It is therefore apparent that under the term of sarcoma we find a group of tumors possessing the widest differences in histological make up. They may have nothing in common either in color, texture or consistence ; in fact, they cannot be distinguished in this way from nonmalignant tumors. What marks their malignancy is their invasion into the surrounding structures.

Sarcoma is usually a disease of early life, and more frequently than any other tumor is the result of an injury, such as a blow, although carious teeth or any other irritation may be its cause.

It is evident from what has been said that the boundary lines between the various connective tissue tumors (sarcomata) cannot be drawn with anything like precision. There may be a single tumor in all stages of development of tissue at one and the same time. In others, there may be in evidence immature cells in an

otherwise fully matured growth. With this condition existing, it becomes clear why I have hesitated to distinguish between these tumors; but in a general way it may be said that rapidity of growth, softness of texture, invasion into surrounding structures, tendency to break down and ulcerate, great pain, and often very disagreeable odors, all lead to infer that we are dealing with a malignant disease; not to forget that all tumors with periosteum or bone as their base should be looked upon with suspicion, and generally removed.

There is a time in the history of each of these tumors when they are but a local disease, and when perfect removal can be accomplished. To this, of course, early recognition and speedy treatment are most essential. In the removal of these tumors the danger of their infecting tissues far beyond the recognition by the naked eye must not be lost sight of, and to effect a cure a most thorough removal and radical work is the problem before us. "Early and thorough removal" is the motto. While the question which method is the one least liable to lead to disfiguration is an important one, the one how we can reach every diseased point still remains the most important. If at all possible we should always cut wide of the disease, and in almost all cases this can be done when the operation is undertaken early. In some cases it may not be necessary to make external incision; however, each case becomes a law in itself, and the diagnosis and prognosis are the governing rules in the mode and manner of operation.

Let me add that it is remarkable that even the most generous removal of either upper or lower jaw creates so little disfigurement in comparison with what one would expect from such an operation. Every one who has seen these cases becomes impressed with this fact.

I am aware that the study of these tumors is beset with a great many difficulties, and that an exposé of them in language intelligible but not too technical is even a still greater task. I have tried to make myself clear, yet if I have not I can only feel that this again illustrates the necessity of more frequent discussion and study of such topics as this.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

Regular meeting June 2, 1896, the President, Dr. Louis Ottofy, in the chair.

Dr. R. H. Kimball read a paper entitled "Dentistry in the Orient."

Dr. C. S. Case read a paper on "Facial Dentistry."

DISCUSSION.

Dr. JAMES W. SLONAKER: I desire to say a word or two in regard to the nervelessness of the Japanese and Chinese. During the World's Fair I operated on a Japanese who had a large abscess in the face, the result of an inverted wisdom tooth, and I have never in all my experience seen a man who could endure pain so easily. It seemed as if this man had absolutely no nerves. There were four or five fistulous openings in the face, and as far as the patient manifesting any suffering, one might as well have been working on a wooden man. It was really astonishing.

Dr. G. NEWKIRK: I do not think any of us are capable of discussing the interesting paper of Dr. Kimball, and yet we should not permit it to pass without a word of commendation. For my part, I have greatly enjoyed it. It is interesting and timely, and I am sure we all regard it as a very instructive contribution.

Dr. J. W. WASSALL: I desire to say that I regard Dr. Kimball's paper as one of the most interesting descriptions of dentistry as it is practiced in a foreign country that I have ever listened to.

Dr. KIMBALL: I just asked my friend Dr. Reid where the Chinese in Chicago go to have their dental work done. It never occurred to me before. I do not know whether they go to dentists in this country or not. I am glad to have the testimony of Dr. Sloanaker regarding the nervelessness of the Chinese. The more you see of them the more you are in close contact with them, the more deeply are you impressed with that feature of the Chinese make-up. It is remarkable what operations they can undergo without manifesting the slightest discomfort.

Dr. MATTESON: Is it not fortitude?

Dr. KIMBALL: I will give you instances taken from the same book I referred to in my paper, "Chinese Characteristics,"

by Arthur G. Smith. It is an interesting book to read. He is a witty writer, and I think the book can be obtained in this country. In speaking of nervelessness he cites three instances, two of which came under his personal observation, and which I think answer the question of fortitude. Being one day in a native house he heard a loud outcry from a child. In going to see what occasioned it, he found underneath the window of his room was quite a large adobe bee hive, with an opening at the bottom through which a fourteen months old Chinese baby had thrust its head, attempting to crawl in. As soon as it thrust its head into the hole there was a yell, as might be inferred. When the child was taken out it had about thirty stings. It cried for a few minutes only and then went to sleep. The next day it was apparently all right. There was not much fortitude about that.

Another case was one of typhus fever, the patient being in the thirteenth day of the progress of the disease. It took three men to hold him, and finally in desperation, after he had exhausted the strength of these men, they tied him to the bed, he went to sleep, and in the course of the night he succeeded in undoing the ropes and escaped. They discovered that he was gone at about three o'clock in the morning. He had left the hospital without a stitch of clothing on him. He had mounted the walls which surrounded the campus. (Every building in China stands usually separately in what is known as a campus.) The wall in this case was about ten feet high, and he had succeeded in scaling it. He was finally discovered in water up to his neck, was taken out, it cooled his fever, and he made a good recovery.

DISCUSSION ON DR. CASE'S PAPER.

Dr. J. W. WASSALL: It is quite impossible for me to do justice to this paper. I was asked by the secretary to open the discussion on it yesterday, and informed that I could not have an opportunity of reading the paper before it was presented, that I could see Dr. Case and find out the general trend of it from him. I have not had time to do that, and this is the first time I have had the pleasure of knowing the contents of the paper.

One of the greatest problems which presents itself to any practitioner of dentistry is whether or not to extract bicuspid in the treatment of cases of irregularity in children's teeth. It is a question which calls for our greatest wisdom, and I think Dr. Case

has given us to-night some points that will always be guides. I want to congratulate the society that we have members who can prepare such a paper as this; members who are willing to come before it and give to the whole profession the results of life-long study. Only a few days ago Dr. Harlan made a remark that I scarcely believed at the time. He said that the Chicago Dental Society has more good papers than any other society of its kind in the world, and that consequently its transactions were more valuable than those of any other dental society. I am sure the two papers we have had to-night fully warrant such a statement. I regret that I cannot intelligently discuss the paper of Dr. Case. The rules that have been formulated by it are authoritative so far as I am concerned.

Dr. THOMAS L. GILMER: I do not feel that there are many of us here to night who can properly discuss this subject, but we certainly can commend the essay. There is one thing that forcibly comes to my mind. It is this, that one of the best things we can do for our patients who have irregularities of the teeth is to turn them over to specialists. I do not believe there are many of us that are capable of treating these cases in the most scientific manner. My office is very close to that of Dr. Case, so that when I desire information in regard to some of these things I call on him, and he is always willing to tell me anything I wish to know, and I sometimes succeed fairly well after he has told me just what to do and furnishes the material out of which to make the appliances. I recall a case very distinctly where a good many years ago I was in doubt as to the propriety of extracting some of the teeth for the purpose of correcting an irregularity. In that case I extracted the first molars, as they were badly decayed. It was quite a bad case of irregularity, but I secured a very satisfactory result without any other treatment than the removal of the first molars. Oftentimes we may secure the best results by the extraction of certain teeth. Nature will do a great deal if left alone. I had not thought that a man's disposition might be changed by changing his physiognomy, but I presume that it is true, and that we may change his disposition by improving his facial expression. It is generally believed that the physiognomy is made by the character of the individual, but my opinion has been modified since I have heard the doctor's excellent paper.

There is another thing that the paper brings to our minds, and

that is the importance of early studying and watching the development of the faces and jaws of our patients. It is a thing we do not give as much attention to as we should.

Dr. R. H. KIMBALL : When I rise to say something on this subject I am sure you will not think for a moment that it is because I claim to be an authority upon it. Fifteen years ago I *did* think I knew considerable about it. While in China, some of these cases presented themselves for treatment, and I had to do the best I could. I am sure every one of us feel that we have been benefited by this able paper, and that we owe the essayist a debt of gratitude for contributing it. I was particularly glad to hear what Dr. Case said regarding the study of the faces of parents. The need for that was very clearly shown to me some years ago. By studying the faces of the parents it materially helps us in correcting irregularities in children. From the parents we get a very valuable guide as to what to do.

Dr. J. G. REID : I do not intend to say very much on this subject, but this particular case, No. 9 I think it is, has called to my mind one or two cases that I have seen of attempted regulation by dentists who did not know anything about regulating teeth. If a dentist finds that he cannot properly regulate the teeth of his patients, or overcome irregularities, he ought to let the business alone, or at least be honest enough with himself and with his patients to recommend them to go to some one who knows something about regulating teeth. I take it for granted that any man who practices dentistry, if he is fortunate enough to be engaged in a very active practice, has not time to devote to the regulating of teeth and expect to bring his operations to a successful issue. I have a few gray hairs in my head, and the most of them were brought on by trying to regulate the teeth of one or two cases. I sometimes think that if I had never undertaken the operation I would have been free from gray hairs. I think a great many dentists will have gray hairs in their head in trying to do things they do not know how to do. It is gratifying to me to be able to tell my patients when they come to me with such deformities as we have seen to go elsewhere for treatment ; in other words, I recommend them to a specialist who knows how to regulate teeth, to a man who knows how to make the faces of patients pretty if they are already homely. I certainly feel I am doing my patients a kindness by referring them to a specialist in this work,

and usually they are grateful to me for recommending them. I do not think that I am the loser in the end because I refer one of my patients to another practitioner, and who makes a few dollars out of the case which I would not get. I rather think it is going to benefit me, and particularly my patient. I know that a great many of us are afraid to recommend our patients to a specialist simply because he is going to get a few dollars out of the case that we are not going to get.

I wish to compliment the essayist for this paper. Yesterday, Dr. Case told me that he thought that this was the best paper of his life, and I certainly believe that to be true; and if he continues to improve as he has in this one we will get some valuable information in the next few years.

Dr. J. N. CROUSE: I am not going to attempt to discuss this subject to any great length, but I would like to have this society give to the profession the results that come out of such a paper as this. Therefore I am going to make a motion under the head of miscellaneous business, that this paper be condensed and its salient points brought before the American Dental Association, so that it will be published broadcast all over this country. I think this society has had presented to it two of the best papers we have ever listened to. One was read at a recent meeting, on medical remedies, or something similar to it, which I consider one of the best contributions presented to this society, and the paper presented by Dr. Case we may well be proud of. It should be condensed and again presented before the proper section of the American Dental Association. If local dental societies do not take up the work and present it to the profession in this way there is no use of having the American Dental Association. The local societies have not yet grasped the idea or acted upon it.

Dr. A. E. MATTESON: I have been very much interested in the paper, and would say that it would be a difficult matter for any one to discuss this subject in an offhand way. The paper itself covers the ground very thoroughly, and I can see nothing in it that can be criticised. In order to discuss it intelligently one should study it for hours and hours. I want personally to thank Dr. Case for his valuable paper. It is one of the best I have ever heard.

Dr. THEO. MENGES: I wish to say a word or two on this paper, not exactly on the subject matter itself, but a thought has been awakened with reference to the paper and to the work. It is

absolutely impossible for a general practitioner to successfully perform operations in orthodontia. It is just as possible for the general practitioner of medicine to be an oculist or aurist, or to be any other special operator in any particular line in general medical practice. This is a specialty. We teach it in the various schools to a greater or less extent. Our students get a smattering of orthodontia from the lectures and clinics, and perhaps three or four students out of one hundred may take up this subject and pursue it with some degree of success after they leave college. I believe that we should have a special school in orthodontia. I believe that the general practitioner of dentistry should not undertake operations in orthodontia, and I believe he does the profession and his patients an injustice when he attempts it. There should be a special school for teaching orthodontia. Such men as Case and others should establish a school in Chicago, and the colleges of this city should recommend students to such an institution to perfect them in a post graduate course in orthodontia.

Dr. W. A. STEVENS: At first I thought I would not take part in this discussion, but the remarks of the last speaker lead me to say something, and I want to say this, that whether a man be a practitioner of any kind whatsoever, an oculist, an aurist, he has not completed his education if he has not completed a full medical course, or who follows the specialty of Dr. Case, he has not completed his dental education until he has covered pretty much the subject which Dr. Case has presented to us to-night. I do not believe in specialties such as most of the medical profession are to-day practicing, and if such a school is established as has been proposed by Dr. Menges, I want somebody else to furnish Dr. Case with financial support in order to properly conduct it, for if he depends upon students he will not get enough to pay expenses. Propositions of this kind look smooth and easy when they are presented to us, but when you get a patient, no matter what the age may be, he or she will not always submit to the application of the apparatus which Dr. Case has presented to-night. I may say that 99 per cent of our patients will not submit to it. I judge from a small experience. I will speak of a case which I had three or four years ago. The mother did not wish me to put on a regulating appliance because it would make the child's teeth sore. What did I do? At first I made an apparatus, put on until the child became accustomed to wearing something in the mouth. The

child wore it for nearly a year before you could produce pressure. The mother was not satisfied with the progress I was making in the case, and the patient went to somebody else. I should not complain for I was well paid for what I done. If I had received Dr. Case's letter before I commenced the treatment of this case I should have turned it over to him.

I do not know whether Dr. Case has ever visited Scotland or not. While I was on a visit to Glasgow I visited a dental school, and I saw the greatest display of irregularities that I have ever seen before or since. So far as the cases of irregularities presented here to-night by Dr. Case are concerned, they do not compare with many that I saw in that school. All of the cases were of the poorer class of people who could not afford to pay to have their teeth regulated. While a great many of you will say that you do philanthropic work, I must confess that there is not one of us but what works for the dollar.

DR. GARRETT NEWKIRK: I do not feel like discussing anything that has been said by Dr. Case in his paper. It was simply all I could do to follow him and get anything like all the meaning that was embodied in his descriptions, and it is a subject, as you know, to which I have paid some little attention. I think the best thing we can do is to get hold of this paper, as soon as it is published, and carefully study it, every one of us until we think we really understand just what is meant by these illustrations and descriptions. This paper represents the closest study, the most careful observation for years. We have had to-night presented the essence boiled down of the judgment, the observation and reflection of Dr. Case. I think I can say without a suspicion of flattery, that there is not another man in the world who could have presented a paper like this. I wish some of the wise gentlemen in New York, who have supposed in the past that all wisdom lived and would die with them, and who undertook to sit upon our friend a few years ago when he went down there, could have been here to-night to have heard this paper. They might wish they had persuaded him to locate in New York instead of Chicago, so they could have had the honor to-day of having him among them as a citizen and a scientific investigator, and one who would honor them as a leader in this line of thought.

In regard to Dr. Crouse's suggestion it would be a good thing if this paper could be presented properly as Dr. Case would like

to have it presented before the American Dental Association, and published as it should be, properly illustrated, for the benefit of the whole professional world. If Dr. Case is let alone, I have no doubt that in the course of a few years he will have in his possession such an abundance of material that he can give us one of the finest works in book form on this subject that has ever been or ever will be presented.

A remark was made by our venerable friend, Dr. Stevens, as to the difficulty of getting patients to wear regulating appliances. It seems to me, that if a man knows just what he is about and has the aptitude for managing his patients, and can make such appliances as Dr. Case does, exerting pressure in a delicate way and in moderate amount, just as it should be exerted, he will seldom have any difficulty in the management of his patients. If he does not succeed it is his own fault. It will be evidence that he does not quite understand what he is about.

Dr. CASE (closing): I feel somewhat overwhelmed by the complimentary remarks that the gentlemen have so kindly made, and hope that all of the possibilities they have outlined will some day prove true, but I fear not.

A week ago last Saturday Dr. Peck reminded me while we were watching a game of base ball that I was to read a paper the following Tuesday. It was quite a shock to me at the time, because I supposed I had a little more time for preparation. I had not thought what subject I should present to-night. Of course, I have something of a repertoire in my teaching and practice in this department, and that night I decided to present this particular subject to which I have given much thought and study. The discussion seems to have drifted into irregularities of the teeth in general. While I agree with some of the gentlemen that there are many cases of irregularities of the teeth that they ought to send to a specialist, the subject I have presented has no special relation to these. It pertains particularly to the extraction and saving of teeth in ordinary cases that come to you day after day, and it is in this alone that I hoped the paper would do its good. The models which I have presented were those which I believed would most perfectly illustrate this idea; I did not select extreme cases of dento-facial deformities to create surprise and admiration of difficulties overcome, but selected cases that would occur in everyday practice.

The first two cases were selected because they illustrate a common irregularity that might be treated in a similar manner by any one who ignored the demands of the physiognomy; and as has been fully illustrated these demands call for a radical difference in the method of treatment. A thing which could not be determined by a view of the teeth alone, or without an intelligent study of the face in its relation to the teeth and jaws.

The other models were selected to illustrate the important feature of my paper and certain principles which I believe are destined to exert a beneficial influence in the contemplation of saving or extracting the teeth of children to correct or prevent a facial deformity.

[Dr. Case's paper with illustrations will be published in the September number of the DENTAL REVIEW.—EDITOR.]

TOOTHACHE SIDETRACKED.

With the recurrence of the perennial sea-serpent and the repetition of astounding tales of forest and stream, the lay press is filled these warm summer days with entrancing tales of diseases and phenomenal malformations. One of the latest stories that has evolved from the imagination of a writer on the shores of Lake Erie is a method of throwing pain off on a short circuit. It is claimed that a physician in a leading Ohio city has been experimenting for eighteen years endeavoring to work out his idea. This doctor reasoned that if the crossing of electrical wires produced a short-circuited current, or stopped it from reaching a certain point to which it otherwise would have traversed, so also there must be a way to cross the nerves of the face, and produce a short circuit in that. In this is said to lie the power of his invention. A very ingenious apparatus produced is described as having been devised by this physician. It deals with minor currents which can be controlled to the minutest fraction by the operator. An electrode is placed over the nerves near the temple, and one wire is attached to a drill by which a tooth is excavated. The wire over the nerves makes a short circuit through the tooth and face, and in this way the sensation is prevented from reaching the brain, and the patient of course enjoys what would otherwise be a very painful process of tooth-pulling. The inventor claims that it can be applied to surgery as well. If so, it will probably be possible for the patient to enjoy life reading his paper and sipping his morning coffee while having a limb amputated, and death from chloroform and ether narcosis will become a thing of the past.

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DEFECTS IN MAKING CROWNS AND FITTING THEM.

A number of times during the past few months we have taken off bicuspid crowns because caries had begun on the sides of roots. In some cases the cavities were so deep that it was almost impossible to reset them. The lesson we drew from these cases was that the crowns were not carefully fitted to the sides of the roots primarily, and secondarily the sides were not festooned properly to permit of easy cleansing of the spaces between the necks of the teeth.

Much care is necessary in the fitting of a band to a root; still greater care should be exercised to contour the crown on the proximal surfaces to protect the interproximal spaces. Bridge work is menaced by lack of all such precautions. The piers when lost or maimed will spoil all artistic mechanical work by rendering it useless. We have rarely seen cavities on the labial or lingual surfaces of roots after crowning, but nowadays we see many cavities on the surfaces mentioned. Many teeth would be preserved for a longer period of usefulness if they were carefully filled instead of being cut off to receive a poorly fitted crown. Look at your own cases and see where the fault lies.

THE AMERICAN DENTAL ASSOCIATION.

The thirty-sixth annual meeting was held at Saratoga, August 4, 5, 6 and 7. The president delivered an address in which he advocated the unification of dental laws in the United States. The sections made their annual reports, save sections 1 and 3. No.

papers were offered in these two practical sections ; prosthetic dentistry and operative dentistry. This is the first year since the section method has been in vogue, eighteen years, that the association has had no report suitable to be discussed by the practical members. A report of progress was read by the chairman and secretary of literature and nomenclature. Most of the section reports were meager in the extreme. Pathology and surgery and materia medica and therapeutics loomed up best of all.

It is a mistake to hold all of the annual meetings in August. The best work cannot be done by men when the thermometer registers about 90° all of the time. If the association is ever to become American, in fact as well as in name, provision must be made to hold meetings in different sections of the country at appropriate seasons of the year.

Next year the meeting will be held at Old Point Comfort, Va. This is done so that union may be effected with the Southern, and have the forces not divided every year. If this can be done, perhaps in a few years we can hold very profitable and interesting sessions annually. With the election of the new president we are sure of one thing—that he will do his utmost to have a good, scientific meeting. We extend our cordial support to him and his administration for the coming year.

DOMESTIC CORRESPONDENCE.

SAN JOSE, CAL., July 25, 1896.

TO THE EDITOR OF THE DENTAL REVIEW.

Dear Sir :—In view of the many discoverers of cataphoresis, or more properly speaking, electrolytic obtunding of sensitive dentine, I wish to call the attention of the dental profession to the following extract from a paper that I read before the Minnesota State Dental Society at their annual meeting in 1888, also read at the Southern Minnesota District Society at their semiannual meeting in fall of 1888 ; also was read at the twenty-fifth annual meeting of the Chicago Dental Society, held in the Grand Pacific on February 5, 6, 7, 1889, by the secretary of that society in view of my enforced absence. The transactions of that meeting in which the article appears, were published in the February number of the DENTAL REVIEW ; subsequently they were published in book form,

and each member and all visiting members were furnished with a copy. The article appears on page 113 of these transactions.

Prof. Weeks, of the dental department of the University of Minnesota, read a very interesting article on this subject at this same meeting as we were working on the same line and his attention having been called to the subject by the paper I read at the meeting in this summer of 1888. The subject was discussed at some length by Drs. Custer, Atkinson, Thompson, Harlan, Baldwin and Taft.

The difference in my present method is to make the current constant from nine to fifteen minutes, as the needs of the case may suggest. The formula is one that any dentist can compound and any good galvanic battery of twelve cells will do the work. The matter was given to the dental profession of the world through the medium of the Minnesota State Dental Society.

"This method that we shall present to you at this meeting, to gain insensibility in teeth is the following :

"To a 12 per cent solution of cocaine add an equal amount of absolute alcohol, making a 6 per cent solution of cocaine in alcohol. In connection with this I use the galvanic current, varying the power as the needs of each case may indicate. The method of application is as follows :

"First apply the rubber dam, wet a pledget of cotton in the solution, placing it in the cavity of the tooth, pressing the point of the positive pole on to the cotton, and the negative pole, with sponge attachment thoroughly wet to the cheek, turning on the current. Rarely will more than four cells be necessary, if the battery is in good working order.

"An application of three minutes with an interval of three minutes and then another three minute application are sufficient in the majority of cases, although I have to occasionally make the third application; then dry the cavity thoroughly and commence excavating. My deductions as to the physiological effects are as follows: The galvanic current acts as a vehicle for conducting the medicinal agents; the cocaine anæsthetizes the odontoblastic cells and the pulp; the styptic properties of the alcohol acts upon the dentinal fibrils, they being of an albuminous nature, causing contraction and increased density and firmness.

"My reasons for drawing these conclusions are these: I have found that the most sensitive teeth can be obtunded; that

after a certain period of rest sensitiveness returns, but never to that degree that existed before the application of the obtundent. Therefore, I conclude that a change has taken place in the dental fibrils, which I maintain is due to the styptic properties of the alcohol, and not to the electrolytic action of the galvanic current. Another reason is that a tooth in which the pulp is devitalized is a nonconductor of the electric current. A tooth which had been extracted was subjected to a twelve cell current of a freshly charged battery, and proved an absolute nonconductor.

"In the treatment of peridental inflammation we have to use a stronger current for this reason: It is well known that a strong current will tetanize the vessels, causing a diminished flow of blood to the parts, thus lessening congestion. The same current longer continued will cause electrolytic decomposition. There are laws of galvanic electricity that are incontrovertible. The medicinal agents that I use in all cases of peridental inflammation and the blind abscess are as follows:

"A saturated solution of chloride of sodium, 7 ounces; tincture of ergot, 1 ounce. In the chloride of sodium we have one of the constituents of the blood, where it keeps the fibrine and albumen in solution. The tissues in an inflamed condition lack this element, which we supply artificially. In the tincture of ergot we have a drug that stimulates the contraction of the blood vessels, causing anæmia. Taken together, we have here a combination which decreases the flow of the blood, reducing congestion, at the same time furnishing an element which is lacking, and upon the presence of which normal conditions depend.

"The treatment of blind abscess requires stronger battery power, in order that we may get the full benefit of electrolysis.

"Dr. Weeks informs me that he has had remarkable success in using this method in removing pulps. My experience in this line has been exceedingly limited, having used it in only two cases. The first was partially successful, and the second was a complete success. The failure of the first I attributed to the congested condition of the pulp. I would recommend getting the pulp in a healthy condition first, as I find that in cases where we have an inflamed condition the full anæsthetic effects are not so easily gained as where the pulp is normal."

Very respectfully,

D. F. McGRAW.

REVIEWS AND ABSTRACTS.

ILLINOIS STATE BOARD OF HEALTH. Extract from the revised statutes of Illinois, 1891. Medicine and surgery, chapter 91. To promote the science of medicine and surgery.

An act to regulate the practice of medicine in the State of Illinois. Approved June 16, 1887; in force July 1, 1887.

5. QUALIFICATIONS FOR PRACTICE, DIPLOMA, EXAMINATION, CERTIFICATE OF STATE BOARD OF HEALTH. Section 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly:* That no person shall practice medicine in any of its departments in this State unless such person possesses the qualifications required by this act.

If a graduate in medicine, he must present his diploma to the State Board of Health for verification as to its genuineness. If the diploma is found genuine, and from a legally chartered medical institution in good standing, and if the person named therein be the person claiming and presenting the same, the State Board of Health shall issue a certificate to that effect signed by all the members thereof, and such certificate shall be conclusive as to the right of the lawful holder of the same to practice medicine in this State.

If not a graduate, the person practicing medicine in this State shall present himself before said board and submit himself to such examination as the board may require, and if the examination be satisfactory to the board, the said board shall issue its certificate in accordance with the facts, and the lawful holder of such certificate shall be entitled to all the rights and privileges herein mentioned.

6. STATE BOARD OF HEALTH, ORGANIZATION, ETC., CERTIFICATES. Section 2. The State Board of Health shall organize within three months after the passage of this act; it shall procure a seal, and shall receive, through its secretary, applications for certificates and examinations; the president and secretary shall have the authority to administer oaths, and the board to take testimony in all matters relating to its duties; it shall issue certificates to all who furnish satisfactory proof of having received diplomas or licenses from legally chartered medical institutions in good standing as may be determined by the board; it shall prepare three forms of certificates, one for persons in possession of such diplomas or licenses, the second for candidates examined and

favorably passed on by the board, and a third for persons to whom certificates may be issued as hereinafter provided in section 12 of this act ; it shall furnish to the county clerks of the several counties a list of all persons receiving certificates. In selecting places to hold its meetings, it shall, as far as is reasonable, accommodate applicants residing in different sections of the State, and due notice shall be published of all its meetings for examination.

Certificates shall be signed by all the members of the board, and the secretary of the board shall receive from the applicant a fee of five (5) dollars for each certificate issued to such graduate or licentiate. Graduates or licentiates in midwifery to pay the sum of two (2) dollars for each certificate. All such fees for certificates shall be paid by the secretary into the treasury of the board.

7. VERIFICATION OF DIPLOMA, AFFIDAVIT. Section 3. The verification of the diploma shall consist in the affidavit of the holder and applicant that he is the lawful possessor of the same, and that he is the person therein named. Such affidavit may be taken before any person authorized to administer oaths, and the same shall be attested under the hand and seal of such officer, if he have a seal ; and any person swearing falsely shall be deemed guilty of perjury, and punished accordingly.

Graduates may present their diplomas and affidavits, as provided in this act, by letter or by proxy, and the State Board of Health shall issue its certificates the same as though the owner was present.

8. EXAMINATION BY BOARD. Section 4. All examinations of persons not graduates or licentiates, shall be made directly by the board, and the certificates given by the board shall authorize the possessor to practice medicine and surgery in the State of Illinois.

9. CERTIFICATE TO BE RECORDED. Section 5. Every person holding a certificate from the State Board of Health shall have it recorded in the office of the clerk of the county in which he resides within three months from its date, and the date of the recording shall be endorsed thereon. Until such certificate is recorded as herein provided, the holder thereof shall not exercise any of the rights or privileges conferred therein to practice medicine.

Any person removing to another county to practice, shall record the certificate in like manner in the county to which he re-

moves, and the holder of the certificate shall pay to the county clerk the usual fee for making the record.

10. **BOOK TO BE KEPT.** Section 6. The county clerk shall keep, in a book provided for the purpose, a complete list of the certificates recorded by him, with the date of the issue of the certificate. If the certificate be based on a diploma or license, he shall record the name of the medical institution conferring it, and the date when conferred. The register of the county clerk shall be open to public inspection during business hours.

11. **FEES FOR EXAMINATIONS.** Section 7. The fees for the examination of nongraduates shall be as follows: Twenty (20) dollars for an examination in medicine and surgery; ten (10) dollars for an examination in midwifery only; and said fees shall be paid into the treasury of the board. If an applicant fails to pass said examination, his or her fee shall be returned. Upon successfully passing the examination, the certificate of the board shall be issued to the applicant without further charge.

12. **CHARACTER OF EXAMINATION.** Section 8. Examinations may be made in whole or in part in writing, and shall be of an elementary and practical character, but sufficiently strict to test the qualifications of the candidate as a practitioner.

13. **REFUSAL OR REVOCATION OF CERTIFICATE.** Section 9. The State Board of Health may refuse to issue the certificate provided for in section 2, to individuals guilty of unprofessional or dishonorable conduct, and it may revoke such certificates for like causes. In all cases of refusal or revocation the applicant may appeal to the Governor, who may affirm or overrule the decision of the board, and this decision shall be final.

14. **DEFINITION OF PRACTICING PHYSICIAN.** Section 10. Any person shall be regarded as practicing medicine, within the meaning of this act, who shall treat, operate on, or prescribe for any physical ailment of another. But nothing in this act shall be construed to prohibit service in cases of emergency, or the domestic administration of family remedies. And this act shall not apply to commissioned surgeons of the United States Army, Navy or Marine Hospital service in the discharge of their official duties.

15. **ITINERANT VENDOR OF DRUGS, ETC., LICENSE.** Section 11. Any itinerant vendor of any drug, nostrum, ointment or appliance of any kind intended for the treatment of disease or injury, or who shall, by writing or printing, or any other method, profess to cure or treat disease or deformity by any drug, nostrum, manipulation or other expedient, shall pay a license of one hundred (100)

dollars per month into the treasury of the board, to be collected by the State Board of Health, in the name of the People of the State of Illinois, for the use of said Board of Health, and it shall be lawful for the State Board of Health to issue such license on application made to the State Board of Health, such license to be signed by the president of the board, and attested by the secretary of the board, with the seal of the board.

Any such itinerant vendor who shall vend or sell any such drug, nostrum, ointment or appliance without having a license so to do, shall, if found guilty, be fined in any sum not less than one hundred dollars, and not exceeding two hundred dollars for each offense, to be recovered in an action of debt before any court of competent jurisdiction. But such board may for sufficient cause refuse such license.

16. PENALTY FOR PRACTICING WITHOUT CERTIFICATE, USING ANOTHER'S DIPLOMA. Section 12. Any person practicing medicine or surgery in the State without the certificate issued by this board, in compliance with the provisions of this act, shall for each and every instance of such practice forfeit and pay to the people of the State of Illinois, for the use of the said State Board of Health, the sum of one hundred (100) dollars for the first offense, and two hundred (200) dollars for each subsequent offense, the same to be recovered in an action of debt before any court of competent jurisdiction, and any person filing or attempting to file as his own the diploma or certificate of another, or a forged affidavit of identification, shall be guilty of a felony, and upon conviction, shall be subject to such fine and imprisonment as are made and provided by the statutes of the State for the crime of forgery.

Provided, that all persons who have been practicing medicine continuously for ten years within the State prior to the taking effect of the act to which this is an amendment, and who have not under said original act, obtained a certificate from the said Board of Health to practice medicine in this State, shall upon proper application to said Board of Health receive such certificate, unless it shall be ascertained and determined by said Board of Health, that the person so applying for a certificate is of immoral character, or guilty of unprofessional or dishonorable conduct, in which case said Board of Health may reject such application.

And Provided, that such application for a certificate shall be made within six months after the taking effect of this act, and all persons holding a certificate on account of ten years' practice shall be subject to all the requirements and discipline of this act, and

the act to which this is an amendment, in regard to their future conduct in the practice of medicine the same as all other persons holding certificates, and all persons not having applied for or received such certificate within six months after the taking effect of this act, and all persons whose applications have for the causes herein named been rejected or certificates revoked, shall, if they shall practice medicine, be deemed guilty of practicing in violation of law and shall suffer the penalties herein provided.

17. JUDGMENT UPON CONVICTION, APPEAL. Section 13. Upon conviction of either of the offenses mentioned in this act, the court shall, as a part of the judgment, order that the defendant be committed to the common jail of the county until the fine and costs are paid, and upon failure to pay the same immediately, the defendant shall be committed under said order.

Provided, that neither party may appeal in the same time and manner as appeals may be taken in other cases, except that where an appeal is prayed in behalf of the people, no appeal bond shall be required to be filed, whether the appeal be from a justice of the peace, or from the county or circuit court, or from the appellate court. But it shall be sufficient in behalf of the people of the State of Illinois, for the use of the State Board of Health, to pray an appeal and thereupon appeal may be had without bond or security.

17a. REPEAL. All acts and parts of acts inconsistent or in conflict with this act, are hereby repealed.

FORMALIN AS A PRESERVATIVE. By H. A. L. RYFKOGEL, M. D., San Francisco, Cal. Curator of the Museum, Medical Department, University of California, and Assistant Demonstrator of Anatomy, Medical Department, University of California.

To find an ideal preserving fluid has long been the aim of those taking an interest in the care of specimens of organic life.

Such a preservative must not alter the preparation in any way; it should cause no shrinkage nor hardening, the color of the object ought not to change, the microscopic as well as the macroscopic appearance must be preserved, the fluid should be non-inflammable and obtainable at but little cost. As yet no combination has fulfilled all these indications, nor is it likely that any ever will; for preserving fluids are usually such by virtue of one of these very objections, if such it really be, namely the hardening of albuminous material.

Of necessity all preserving fluids must have antiseptic qualities, and many such, as alcohol and glycerin, are hygroscopic as

well. This last quality is of course not an advantage, owing to the great shrinkage that occurs on the withdrawal of any water from animal tissues.

It is by the presence of these qualities that we must judge the value of the different media in use. Thus, solutions of boric acid, 4 per cent, or carbolic acid, 1 to 2 per cent, are simply antiseptic. Any object placed in these will indeed not suffer putrefactive changes, but after a time will become macerated and practically worthless. Glycerin is hygroscopic and slightly antiseptic. It alters by shrinkage, and is too costly for ordinary use. Alcohol is hygroscopic, antiseptic, and coagulates albumin. It therefore both hardens and shrinks the specimens. It also alters by dissolving out many of the organic pigments. Finally, solutions of formic aldehyde are antiseptic. They harden albumin, but cause no shrinkage, and affect animal pigment but slightly.

Of course, all fluid preservatives alter the appearance of tissues to a certain degree by the withdrawal of blood.

The specimens we show you have been kept in formic aldehyde solution or formalin, which appears to overcome many of the objections mentioned above.

Formic aldehyde, a gaseous body discovered in 1863 by Hoffmann, while passing methyl alcohol and air over hot platinum, is one of a peculiar series of chemical compounds which differ only in the amount of oxygen they contain. The first of these is methane, or marsh gas, of which the chemical formula is CH_4 . The second is methyl alcohol with a formula of CH_4O , and the third, methyleneglycol, is represented by the formula CH_4O_2 . If we now extract from this last one molecule of water, we have the formula of formic aldehyde, CH_2O .

Formic aldehyde is a gas, colorless and possessing a very pungent odor. When inhaled it is very irritating, quickly setting up a coryza or bronchitis. Its point of saturation in water is 40 per cent, and it is this saturated solution that is sold under the name of formalin by Schering. We probably have here a solution of methyleneglycol, for, as shown above, formic aldehyde plus one molecule of water gives us methyleneglycol, thus: $\text{CH}_2\text{O} + \text{H}_2\text{O} = \text{CH}_4\text{O}_2$.

On account of its antiseptic properties, discovered by Blum, it has been used in many diseased conditions dependent on pathogenic germs, but it is of its uses as a preservative and fixing agent that we now wish to speak. These, as mentioned above, depend on its antiseptic powers and ability to harden protoplasm.

Solutions of 1 per cent strength, *i. e.*, one volume of formalin to 40 of water, preserve gross specimens of tissue indefinitely, and so thoroughly that microscopic sections may be prepared therefrom at any time. Solutions of this strength will not, however, fix the cells so as to show fine intercellular structure. Still it is the architecture of the tissue, as it were, that most interests the pathologist, and this will be perfectly shown.

Solutions of even less strength may be used, but with less satisfactory results as regards preservation of color and minute detail. When the object to be preserved has many delicate colors that must be shown, a stronger solution, *e. g.*, 4 per cent to 8 per cent had better be employed. Bodies of insects and reptiles, fruit and flowers should thus be preserved.

You have all noticed that the slime or mucus that covers the bodies of certain fishes, reptiles, etc., and some pathologic specimens become converted into white stringy masses when the animal or tissue is placed in alcohol. This does not occur with formalin in solutions stronger than one in forty (1 per cent); so that any slime or mucus that covers specimens placed therein remains transparent.

Formalin gives beautiful results in the preservation of the central nervous system, showing very distinctly the white and gray matter. For this purpose, however, it has two objections. First, it causes a certain amount of swelling; second, the gray matter becomes very brittle, so that small pieces are broken off in handling. These may both be remedied by making up the 1 per cent solution of formalin in 50 per cent alcohol, thus:

R	Formalin.....	1 part.
	Alcohol,	
	Water.....	aa 50 parts.

This at first glance may appear expensive, but it is not so, for a single emersion will suffice, owing to the great rapidity of penetration of the formalin. Of course, if alcohol alone were used it would have to be changed one or more times to obtain a good result.

If a strong solution of formalin be injected into the digestive tube and carotid artery of a small animal, the specimen may be left hanging in the open air for many months without undergoing change.

Blanchard has preserved leeches in the fluid and found no alteration in the delicate coloration of the animals after a year.

Egg albumen placed in formalin, 4 per cent, solidifies and be-

comes slightly opalescent. If it is now boiled it will not change in appearance.

Formalin has also been of great use to teachers of bacteriology demonstrating cultures in gelatin. For, if the vapor of formalin be introduced into a test tube in which a culture is growing, it immediately arrests the growth of bacteria. Moreover, the gelatin which has been liquefied by the bacteria is again solidified without alteration of appearance. Thus a culture may be kept in any stage of growth desired.

As a fixing agent in solutions of 2 per cent to 5 per cent, it far surpasses alcohol and almost equals the more costly fixing agents, such as osmic acid, etc., killing as it does the cells before any change can take place in the finest intracellular structure. For example, it has been used instead of osmic acid in Ramón y Cajal's method for nervous tissues with better results.

Durig has used 4 per cent formalin as a mordant instead of aniline-oil water.

Cullen, of Johns Hopkins, has devised a method for making frozen sections permanent by means of formalin. He places the section in formalin, 4 per cent, three to five minutes; alcohol, 50 per cent, three minutes; alcohol absolute, five minutes. Cullen finds sections prepared in this manner in twenty minutes after an operation as definite for diagnostic purposes as those prepared by the ordinary methods, which take several days.

To recapitulate, the advantages of formalin over alcohol are as follows:

1. Alcohol by withdrawing the water from a specimen causes great shrinkage. Formalin, acting only by changing the protoplasm, causes very little shrinkage.
2. Alcohol dissolves out most organic pigments and so greatly alters the appearance of objects. Formalin does not do this to any extent.
3. The price of alcohol is nearly \$3 a gallon; that of 1 per cent formalin solution about 30 cents.
4. Alcohol is very inflammable. Formalin, being a watery solution of a gas, is not so.
5. Alcohol by changing mucus or slime to white strings spoils the appearance of objects covered by this material. Formalin by leaving mucus and slime transparent is free from this objection.

The objection to formalin is the irritating quality of its vapor when inhaled. This is, however, not troublesome in the solutions ordinarily employed.

The specimens shown well illustrated the advantages of formalin. Two were specimens of a pneumonic lung, one in alcohol, the other in formalin. From the external surface of the one in alcohol, the delicate mottling and striping had almost vanished. On the contrary the specimen in formalin—in this case 1 per cent—was almost unaltered.

In another jar was a uterus from a case dead of pupura hemorrhagica. This was placed in a 4 per cent formalin solution in order thoroughly to harden the blood clot in the interior of the uterus. After four weeks the uterus was carefully cut across and the specimen was ready. Upon examination it was seen that the blood clot formed a perfect cast of the cavity. Neither the uterus nor the clot had shrunk to any appreciable degree.

Colloid material in the Graafian follicles remains clear and has not decreased in volume; one of them is filled with a clot which, like that in the uterus, completely fills the cavity.

Had this specimen been prepared in alcohol, every thing would have been shrunken and distorted. The clot would not have formed such a perfect cast of the uterine canal and the contents of the Graafian follicles would have appeared as opaque balls or strings filling a small part of their interior.—*Medical Record*.

THE USE OF PEROXIDE OF HYDROGEN IN DISEASES OF THE NOSE, THROAT, AND EAR. BY W. SCHEPPEGRELL, A. M., M. D., New Orleans, La. Vice President of the American Laryngological, Rhinological, and Otological Society; Chairman, Section on Otology, Laryngology, and Rhinology, Louisiana State Medical Society; Vice President, New Orleans Electric Society, etc.

Peroxide of hydrogen is one of the most useful agents which we have in the treatment of diseases of the nose, throat and ear. Its germicidal and antiseptic properties, and its capacity for destroying pus and decaying organic matter without injurious effect on healthy tissues, render it almost indispensable in many cases. It has always been a source of surprise to me that so little reference to this valuable agent is found in the foreign periodicals.

Peroxide of hydrogen is a dioxide or double oxide of hydrogen (H_2O_2), water being simply a monoxide of hydrogen (H_2O). It derives its name "peroxide" from the fact that it is the highest oxide of hydrogen known to chemistry. It was first prepared by Thenard, about seventy years ago, and was known as "oxygenated water," a name still retained in France. A given volume of it, when decomposed, yields four hundred and seventy-five times its

own volume of free oxygen. In its undiluted state it is a strong cauterant of animal tissues and is therefore usually prepared as a 2 or 3 per cent solution, the former yielding, when decomposed, ten and the second fifteen times the volume of the liquid in gaseous form.

Peroxide of hydrogen is not toxic ; in fact, it is used for internal medication, and the amount which may be taken without injurious effect is well illustrated by a case recently reported, in a course of discussion on diphtheria, by Dr. Rudolph Matas. In this case, in which Dr. Matas had occasion to prescribe it for a man suffering from asthma, the patient, from a misunderstanding of the directions, took six or eight four-ounce bottles of peroxide of hydrogen during one night, and was not only not injured by this excessive amount, but actually believed that he had been benefited.

In diseases of the nose, peroxide of hydrogen is an important therapeutic agent. In *ozæna* a wash of a 25 per cent solution is useful ; or, after washing the nostrils with an alkaline or the normal physiological salt solution, the hydrogen peroxide, pure or mixed with an equal quantity of glycerine; may be applied locally by means of an atomizer or applicator with cotton, to remove or destroy any scabs or secretion which may be left. In this way the nostrils can be kept clean, and the offensive odor, which is one of the most unpleasant features of this disease, may be prevented. In purulent rhinitis a 5 per cent solution, to which an alkali has been added, is useful. It is also said to be serviceable in controlling nasal and pharyngeal hemorrhage.

In membranous rhinitis, whether due to the Klebs-Koeffler bacillus or to micrococci, the spraying of the nostrils with a 20 to 50 per cent solution is indicated, and has given me excellent results. My experience in diphtheritic rhinitis with this agent has been so satisfactory that I have not deemed it necessary to use the antitoxin in these cases, as this does not seem to prevent the post-diphtheritic paralysis, which would be the only reason for my using it in diphtheritic rhinitis.

In specific necrosis in the nostrils, peroxide of hydrogen is an important agent, not only for its disinfecting properties, but also for controlling the horrible odor that is present in these cases. In diseases of the accessory sinuses of the nose, peroxide of hydrogen is so beneficial that I use it in all cases, whether of a maxillary, frontal, ethmoidal, or sphenoidal sinus. In my opinion it cleans and disinfects the infractuositities of these cavities more effectively than any agent that we have.

In diseases of the throat, peroxide of hydrogen is used in follicular and other forms of tonsillitis, and in specific affections, and is a sheet anchor in diphtheritic processes in this region. Long before the introduction of antitoxin, I have had excellent results from hydrogen peroxide in diphtheria, and even since the use of this serum I never fail to use the peroxide as a valuable adjunct, and I believe it to have had an important bearing on the results obtained. It attacks the membrane, disinfects the parts, and has no injurious effect when swallowed, which is more than can be said of many other antiseptics used for this purpose.

In a recent case of laryngeal diphtheria, to which I was called in consultation, the stridor and dyspnœa were so marked that I was compelled at once to introduce an intubation tube. The tube, however, was repeatedly coughed out, and I then made use of a procedure which I had found beneficial in former cases—the injection of a 75 per cent alkaline solution of peroxide of hydrogen directly into the larynx, by means of a laryngeal syringe. The relief given by this injection was so great that I was not compelled to intubate again, but simply to make these injections every four hours. The patient also received these injections of diphtheria antitoxin serum, which I made at intervals of twenty-four hours, and the child made a good recovery. Recently a German author called attention to the irritating effects of peroxide of hydrogen on the mucous membrane. This effect I have found in none of my cases, although this may be due to the fact that in employing this agent I make use of a small addition of bicarbonate of soda, and that I adjust the strength of the solution to the requirements of the case.

Diseases of the ear offer a good field for the use of peroxide of hydrogen. As a nonirritating antiseptic wash it is invaluable, as in the various forms of suppuration, especially when they are accompanied with a disagreeable odor. In diffuse or circumscribed inflammation of the external canal, peroxide of hydrogen is useful after an incision has been made; and in suppurative otitis media, especially in neglected cases, a 5 to 15 per cent solution is of great assistance. In cases complicated by inflammation of the mastoid cells, especially in the suppurative form, the indication for peroxide of hydrogen is clear, although this does not prevent the use of iodoform, aristol, and other antiseptic agents.

In acute cases of purulent otitis media, a 5 per cent alkaline solution should be used, as strong solutions are not necessary and may be injurious.

PAMPHLETS RECEIVED.

TRANSACTIONS OF THE AMERICAN DENTAL ASSOCIATION, 1895.

TRANSACTIONS OF THE SOUTHERN DENTAL ASSOCIATION, 1895.

PROCEEDINGS OF THE NATIONAL ASSOCIATION OF DENTAL FACULTIES. Twelfth annual meeting held at Asbury Park, N. J., August 3, 5 and 6, 1895.

DENTAL COLLEGE COMMENCEMENTS.

THE UNIVERSITY OF MICHIGAN.

College of Dental Surgery. Graduates: Elmer Harry Argetsinger, Frank Charles Arnold, Jay Cyrus Arnold, Frank Miller Bacon, Clarence Harvey Bailey, John Wesley Baas, Eddie W. Brown, Edward Dancy Brown, Robert Reynolds Buckthorpe, Harry Sizer Buell, George Franklin Burke, Willis Hezekiah Buttolph, Jessie Estelle Castle, James Nelson Clarke, Charles William Cleaver, Jonathan Peter Collett, B. S., *National Normal Univ.*, Irving William Copeland, Ernest Frank Day, George Leonard David, Edwin Victor Deans, Charles Alphonso Devlin, Stanford James Farnum, Stanley Ammon Farnum, Charles Frederick Fitch, Fred Anson Graham, Fred Joseph Hale, Hector Hillman, Cleveland Artley Houghton, Burton Truman Hunt, Charles Lee Kemery, Vernor Jay Lathrop, John Adolph Lentz, L. L. B., Howard Joseph Livingston, James White Lyons, Thomas Stephen Mann, Samuel Stephen Mummery, James Henry O'Toole, Charles Augustus Phillips, Ross Porter, Frank Glenn Powers, Herman Prinz, Charles Alfred Quackenbush, James Robins, William Howard Roper, Thomas Francis Sheridan, Charles Levant Sherwood, Charles Eyster Slagle, Albert Lyman Smith, William Joseph Stapish, Morley Punchun Templar, Wilber Townsend, Albertus Van Ark, Charles Alfred Wehe, Ralph Levant Williams, Raymond Lester Williams, William Parker Winning, Robert Millard Woodin, George Herbert Wooton, John Alexander Wooton, Percy Bennett Wright.

MEMORANDA.

Dr. J. D. Pfeifer is in Europe.

The dog days are here in full force now.

Dr. W. S. Davenport, of Paris, was at Saratoga.

Dr. J. B. Willmott, of Toronto, was at Saratoga.

Dr. Gordon White, has gone to Europe for the summer.

Dr. H. J. McKellops has removed to 3548 Lindell Ave.

Dr. R. Ottolengui will be the new editor of *Items of Interest*.

Dr. W. D. Miller has removed to 30 Victoria-Strasse, Berlin.

Dr. J. D. Patterson paid a flying visit to Chicago the last of July.

Dr. K. H. Davenport, of London, England, visited the meeting at Saratoga.

Popular newspaper articles got a black eye at Saratoga—from fear of what?

And now you will call it odontotechny—not operative technic or prosthetic technic.

Dr. L. J. Mitchell is visiting friends in the United States and particularly in Chicago.

Dr. C. E. Bentley, of Chicago, leaves for a six weeks' tour through Europe, on August 22.

Do roots decay above crowns? Well we should say they do—mostly on the proximal surfaces.

The Bar is the name of the former *Alumni News*, edited by Dr. C. N. Johnson, for the alumni of the Chicago C. D. S.

Dr. James W. Fowler, of Bordeaux, France, is dead. He located there about forty years ago and enjoyed a large practice for many years.

Attention has been called by Janeway to the value of the Duquesnel solution of aconitine for facial neuralgia. The dose is said to be about $\frac{1}{640}$ of a grain.

Saratoga is about the poorest place in the United States to hold a dental convention. Poor hotels, poor hotel service and high prices for everything you buy.

When nitrate of silver is broken up, we have a precipitate of oxide of silver and free silver. Oxide of silver is *not* a coagulator of albumen as any tyro knows.

The newspaper syndicate has at last gotten hold of the subjects of hypnotism, implanting teeth and facial prosthesis. Vide *Daily News*, Chicago, July 1. Pretty soon dentists will be taking up these subjects!

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

Officers 1896-97: President, J. T. Abbot, Manchester, Iowa; Vice President, H. B. Noble, Washington, D. C.; Secretary and Treasurer, C. A. Meeker, Newark, N. J.

NATIONAL SCHOOL OF DENTAL TECHNICS.

Officers for 1896-97: President, Henry W. Morgan, of Nashville, Tenn.; Vice President, S. H. Guilford, of Philadelphia; Secretary and Treasurer, J. F. Stephan, of Cleveland, Ohio; Executive Committee, D. M. Cattell, N. S. Hoff and Geo. H. Wilson.

Prof. Edwin Klebs has been elected to the chair of pathology in Rush Medical College. This college has recently been recognized by the Examining Board of the Royal College of Physicians and the Royal College of Surgeons of London, England. This recognition entitles its alumni to all the privileges accorded to the graduates of other institutions recognized by that board.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

Officers 1896-97: J. P. Gray, Nashville, President; T. W. Brophy, Chicago, Vice President; Louis Ottofy, Chicago, Secretary; Henry W. Morgan, Nashville, Treasurer; Executive Committee, J. Taft, Thos. Fillebrown and B. Holly Smith; Ad Interim Committee, Thos. E. Weeks, H. A. Smith and J. D. Patterson.

DENTAL SOCIETY OF SOUTHWESTERN MICHIGAN.

The Dental Society of Southwestern Michigan will hold its semiannual meeting at Dowagiac, September 8 and 9, 1896. The Executive Committee are

arranging a very interesting programme, and a good attendance is expected. A cordial invitation is extended to the profession in this and other States:

E. I. BACKUS, D. D. S., *Secretary*,
St. Joseph, Mich.

MICHIGAN STATE DENTAL ASSOCIATION.

The officers of the Michigan State Dental Society for 1896-7 are: President, A. W. Diack, Detroit; First Vice President, E. T. Loeffler, Saginaw; Second Vice President, H. T. Harvey, Battle Creek; Secretary, Henry C. Raymond, Detroit; Treasurer, G. H. Mosher, Jackson. The next place of meeting, Battle Creek.

HENRY C. RAYMOND, *Sec'y*,
Woodward Ave., Detroit.

NEW JERSEY STATE DENTAL SOCIETY.

At the twenty-sixth annual meeting of the New Jersey State Dental Society, held at Asbury Park, N. J., July 29 to 31, inclusive, the following named officers were elected: President, Harvey Iredell, D. D. S., New Brunswick, N. J.; Vice President, J. L. Crater, D. D. S., Orange, N. J.; Secretary, Chas. A. Meeker, D. D. S., Newark, N. J.; Treasurer, Geo. C. Brown, D. D. S., Elizabeth, N. J.

CHAS. A. MEEKER, *Secretary*.

The following officers were elected at the late meeting of the American Dental Association at Saratoga Springs N. Y.:

President, James Truman, of Philadelphia; First Vice President, Thos. Fillebrown, of Boston; Second Vice President, W. R. Clifton, of Waco, Texas; Recording Secretary, Geo. H. Cushing, of Chicago; Corresponding Secretary, Emma Eames Chase, of St. Louis, Mo.; Treasurer, Henry W. Morgan, of Nashville; Executive Committee: S. G. Perry, of New York; W. W. Walker, of New York; and A. O. Hunt, of Chicago.

The next place of meeting selected is Old Point Comfort, Va., immediately following the meeting of the Southern Dental Association.

PRESENT AT SARATOGA.

Those who signed the constitution of the American Dental Association to 1878: 1860, J. Taft, H. A. Smith, Corydon Palmer; 1863, C. N. Peirce, F. J. S. Gorgas; 1864, Wm. N. Morrison, W. P. Horton, E. A. Bogue; 1865, A. P. Southwick, W. H. Morgan, Geo. H. Cushing; 1866, Frank Abbott, S. H. Guilford, H. J. McKellops; 1867, J. G. Templeton, J. N. Crouse, Francis Peabody; 1869, H. L. Ambler; 1870, Thos. C. Stellwagen; 1871, H. B. Noble, C. C. Chittenden; 1872, Chas. J. Essig, A. W. Harlan, W. E. Hoag; 1875, Henry W. Morgan, W. C. Barrett, C. A. Brackett; 1876, Alonzo Boice, J. Bond Littig, T. S. Waters, Thomas Fillebrown; 1877, W. Storer How, T. W. Brophy; 1878, A. H. Fuller.

SEROUS EXUDATION IN THE MAXILLARY SINUS.

Noltenius (*Monatssch. f. Ohrenheilk.*, 1895, p. 114). Thirty-seven cases are reported. In two instances the lesion was bilateral, and the liquid in the sinus contained flocculi in suspension. In all the others the liquid was of a distinct amber color. The differential diagnosis of these cases from those of empyema is difficult. The principal features are: Suborbital neuralgia; much more rarely crises of nasal hydrorrhea, more frequently nasal obstruction without any hypertrophy to account therefore. Exploratory puncture alone can positively deter-

mine the nature of the sinus contents, and this may be practiced below the middle part of the inferior turbinated bone. Treatment consists in the opening of the sinus with a modification of Krause's trocar through the inferior meatus. No lavage is necessary for these cases of serous exudation.

DENTAL THERAPEUTICS.

In the *International Dental Journal* for May, Dr. E. C. Briggs, of Boston, says that he is opposed to dentists going very much into the constitutional treatment of their patients, although drugs have to be used not only locally, but systematically, at times. In cases where a root has been filled and the patient is threatened with some pain about the root of the tooth, perhaps periostitis, periodontitis, or pericementitis, it is often necessary to prescribe some analgesic. In many of these cases where it is impossible to do anything surgically, a great deal can be done for patients by giving them some medicine; and of the analgesics which have proved to be not only safe but of really great value, he says, are the recent antipyretics that have been discovered. One of them, says the author, which has given him marked success, is antikamnia. It is an antipyretic and analgesic which is safe and very reliable in cases of the kind mentioned, especially as it has no depressing effect on the heart. The average dose is 5 grains, and four of these doses will relieve and stop pain about the facial nerves. It is also far better than any amount of morphine, and leaves the patient in good condition for the next day. Dr. Briggs has found that in giving morphine so much of it has to be given in order to overcome the local pain that the patient is saturated with it, and it sometimes takes a week to get over the effect, besides which in the majority of cases the pain has been indifferently relieved by the drug.—*N. Y. Medical Journal*.

REMARKABLE SURGERY.—LIP, UPPER JAW AND PALATE SUPPLIED TO A CHILD.

Dr. A. E. Smith, of Olean, has accomplished a remarkable feat in surgery. A child was born to Mrs. Albert Sawyer, of Grossman Avenue, East Olean, about four years ago. It was a full-sized male infant, well developed, except for certain imperfections. There was no upper lip and no front to the upper jaw; the roof of the mouth was split clear back, and there was no palate whatever. The nose was spread out flat, the tissues beneath were absent, and the face was horribly contorted. Those who saw the child at his birth were sure that he could not live; that if he did his life would be worse than death.

Dr. Smith decided to see what surgery could do for the child. He took the case in hand at once, but it was nearly a year before the child was strong enough to stand an operation.

The first operation was to make a new lip. The material had to be taken out of the tissues of the cheek by cutting in back, loosening up and carrying them forward. This was successfully done, and then an operation was performed to bring together the two parts of the upper jaw that were widely separated. The edges of the bone were freshened, broken down and the several parts then brought together and united with silver wire sutures buried in the bone. This was about three years ago, and the child now has as good an upper lip and upper jaw as possessed by any one.

The child was then too young to undergo the operation to supply the palate, and this was not performed until about three weeks ago. In order to make the palate it was necessary to take tissues from other parts of the mouth. The mucous membrane on each side of the mouth next to the teeth was taken from the

bone and united in the center to fill the open space. After the operation an ingenious method was used to protect it. Dr. Smith made an aluminum plate to fit the palate and hold the dressing against the tissues. This plate was held in place by needles driven through it into the bone. The plate was kept in the mouth about a week, and when it was taken out the success of the operation was at once apparent. The palate had formed rapidly and perfectly, and no one would know now that the child was not born with it.

Except for a slight scar on the lip there is nothing to indicate that it was built up by a surgical operation. It is well formed, and there is nothing unnatural in the expression of the mouth. Before the recent operation to supply the palate the boy could not talk intelligently, except to mumble a few words through his nose, but he now has full command of his vocal organs, and is rapidly learning to talk as distinctly as any four-year-old child. He answered several questions asked by his mother and pronounced several words plainly for the reporter.—*Buffalo Courier.*

BACTERIOLOGICAL REPORT ON LORETIN, BY STANLEY P. BLACK, M. D.

For the past six months loretin has been on trial as an antiseptic in wound dressings in the service of Dr. E. W. Andrews, both at Mercy and Michael Reese Hospitals, and at his request we have investigated its antiseptic properties from a laboratory standpoint.

The drug is a powder of a golden yellow color, odorless, and is soluble in 600 parts of water at ordinary temperature, making a golden yellow solution. When the drug is applied to the cutaneous surface a diffuse yellow stain is produced, which, however, is readily washed off with water. A saturated solution of the drug in nutrient bouillon, 1:600, was made, and from this cultures were made, the strength of the dilutions being 1:700, 1:800, 1:900, 1:1,000, 1:1,100, 1:1,200, etc.

Each dilution was inoculated with a fresh bouillon culture of virulent anthrax bacilli, with the following results :

Dilutions.—1:600, no growths for four weeks; 1:700, ditto; 1:800, ditto; 1:900, ditto; 1:1,000, ditto; 1:1,100, feeble growth on the fourth day; 1:1,200 ditto; 1:1,500, ditto; 1:2,000, strong growth on the fourth day; 1:3,000, ditto.

This series of experiments was repeated on two succeeding occasions and the results agreed perfectly with the first record.

Microscopical examinations were made of each growth and anthrax was found in every instance where growth was reported. Control tubes in each series showed no growths whatever.

The next series of experiments was made with anthrax spores on silk threads. A spore containing bouillon culture of anthrax bacilli was inoculated into distilled sterilized water and sterile silk threads were soaked in this and dried in a sterile Petri dish. These threads were then introduced into the same dilutions as used in the preceding series, and the tubes were placed in the incubator. Growths occurred in the same time and dilution as in series I., with the living bacilli.

These spores containing threads were then soaked for various periods of time, from one up to thirty hours, in a saturated 1:600 solution of loretin in water at a room temperature. The threads were then removed from the loretin solution and introduced directly, without washing, into nutrient sterile bouillon. The results were as follows :

Dilution, 1:600; 1 hour, vigorous growth; 2 hours, ditto; 4 hours, ditto; 6 hours, ditto; 8 hours, ditto; 14 hours, ditto; 30 hours, ditto.

We then used the following bacteria in our experiments : *bacillus pyocyanus*,

staphylococcus pyogenus aureus, staphylococcus pyogenus citreus. The following is the result of these tests :

Bacillus pyocyaneus: 1:900, slight cloudiness at the end of ten days; 1:1,000, turbid at the end of ten days; 1:1,200, ditto; 1:1,500, ditto; 1:1,800, ditto; 1:2,400, ditto; 1:3,000, ditto.

Staphylococcus pyogenus citreus: 1:900, no growth in ten days; 1:1,000, slight growth in ten days; 1:1,200, turbid in ten days; 1:1,500, ditto; 1:1,800, ditto; 1:2,400, ditto; 1:3,000, ditto.

Staphylococcus pyogenus aureus: 1:900, no growth in ten days; 1:1,000, ditto; 1:1,200, ditto; 1:1,500, ditto; 1:1,800, slight cloudiness in ten days; 1:2,400, turbid in ten days; 1:3,000, ditto.

In the next series of experiments threads were soaked in sterilized water which had been copiously inoculated with fresh cultures. The threads were then drained and immersed in a saturated solution of loretin for various lengths of time, then removed and placed directly into sterile bouillon. The following results were obtained: With bacillus pyocyaneus threads immersed in saturated solution of loretin 5 minutes showed abundant growth in 24 hours; those immersed 15 minutes, ditto; 30 minutes, no growth; 1 hour ditto. With staphylococcus pyogenus aureus 5 minutes immersion, slight growth; 15 minutes, 30 minutes, and 1 hour immersion, no growth.

The results of these laboratory experiments would show that while loretin is a rather feeble antiseptic it is much more effective against the most common pus germ, staphylococcus pyogenus aureus, than it is against any other used in our experiments.

COCAINE AND COCAINEISM.

In the *Revue de Thérapeutique Medico Chirurgicale* of March 15, 1896, Sallard contributes a paper with this title, in which, after a brief historical *résumé* of the influence of this drug upon various portions of the body, he proceeds to discuss the causes and symptoms of acute and chronic cocaine poisoning.

After stating that these untoward symptoms arise from subcutaneous and sub-mucous injection, and from the use of large quantities upon the mucous membranes, particularly the urethra, he reminds us that Réclus, after a careful study, has concluded that on an average 3 grains of cocaine is the safe limit for anæsthetic purposes. He also quotes an experience of Abadie's in which, after the injection of two-thirds of a grain of cocaine into an eyelid before an operation upon ectropion, the patient, aged seventy-one years, was seized with coma which lasted for five hours, death ultimately occurring.

He also quotes an experience of Hugenschmidt, a celebrated dentist of Paris, who had a case of syncope lasting half an hour as the result of injecting ten drops of distilled water into the gum, thus illustrating the fact that injections under mucous membranes are capable of producing symptoms independently of the presence of cocaine. We believe this patient had already suffered from an attack of acute cocaine poisoning as the result of an injection. No case of death, however, has resulted after the absorption of a small amount of cocaine. There is one case, however, of a death from the injection into the urethra of a solution containing 8 grains of this drug. The symptoms of acute poisoning under these circumstances are variable; sometimes they are simply those of a brief and fleeting vertigo; in other instances there is great excitation of the nervous system and a tingling in the extremities, with flushing of the skin followed by pallor; in other instances there are gesticulations and the patient passes into a condition of

active talkative delirium. The latter symptoms are seen most frequently in women. In other instances the symptoms are those of marked depression. The vertigo produces nausea or sensations similar to those of sea sickness. There is marked feebleness and the patients are in a condition of semi stupor. There may also be palpitation of the heart and some vomiting. There is marked pallor of the face, dilatation of the pupils, coldness of the extremities, and profuse sweating. Should convulsive symptoms come on, the intoxication is of course exceedingly profound and the prognosis grave. Convulsions are at first tonic, then clonic in character, sometimes resembling those of ordinary eclampsia. There is marked dyspnoea, probably due to tetanic contractions of the respiratory muscles, and cyanosis is present from similar reasons, the cause of death being failure of respiration. The duration of these untoward symptoms produced by poisoning by cocaine is usually from one to two hours, although of course they may last for a longer period of time. Marked insomnia is very apt to follow these symptoms.

Sallard points out that Gauthier has stated that the administration of nitroglycerin will greatly diminish any danger connected with the use of cocaine, and that Glück has claimed that by the use of phenate of cocaine these symptoms can also be avoided.

Goesel has also proclaimed the advantages of tropacocaine as less likely to produce depression of the heart and other untoward symptoms.

Magitot, after stating that only very minute quantities should be used for producing local anæsthesia under the skin or mucous membrane, adds that cocaine injections should never be used in neuropathic patients or in those suffering from cardiac disease or chronic affections of the respiratory passages. Great care should also be taken that it is not introduced into the veins. The patient who receives cocaine instillations should also always be placed in the horizontal position, save in those instances where in operations upon the mouth or head a semi reclining or erect position is indispensable. Again, the greatest care should be used that the hydrochlorate of cocaine is absolutely pure and not mixed with other alkaloids which may possess a toxic influence. It is also well to use the instillations gradually rather than to inject them all at once. Magitot believes that cocaine possesses over chloroform and ether incontestable advantages.

Should symptoms of acute intoxication by cocaine develop in any case, the treatment is to place the patient flat on his back and use slappings of the face and chest with hot and cold towels, ammonia by inhalation, and if necessary nitrite of amyl, and hypodermic injections of ether and caffeine.

Chouppe has recommended that from $\frac{1}{3}$ to $\frac{1}{2}$ a grain of morphine be given hypodermically.

In regard to chronic intoxication by cocaine, or what has been called cocaineomania, Sallard tells us that this habit is constantly increasing in France. The symptoms consist of loss of appetite, cardiac palpitation, headache and vertigo, finally followed by hallucinations or delusions. The following treatment is to be instituted:

In the first place, abstinence from cocaine is to be insisted upon under proper control of attendants or in a hospital. The method of decreasing the cocaine need not be instantaneous, but it should be tapered off rapidly. Hydrotherapeutic measures designed to increase nutrition should be resorted to, and iron, quinine and arsenic, with heart tonics, such as caffeine and sparteine, should be employed. Chloral, trional or sulphonal may be employed to overcome insomnia, and the whole effort of the physician should be directed by means of appropriate exercise and a regular method of life to improving the patient's general nutrition.

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ORIGINAL COMMUNICATIONS.

PRESIDENT'S ADDRESS.

BY CLAUDE A. SOUTHWELL, D. D. S., MILWAUKEE, WIS.

TO THE OFFICERS AND MEMBERS OF THE WISCONSIN STATE
DENTAL SOCIETY :

Gentlemen: Nearly twenty-six years ago the Wisconsin State Dental Association was organized. Like similar organizations of its kind, it has had its ups and its downs, and has seen gloomy days as well as bright ones. To-day it stands in better condition than ever before. This is largely due to the pluck and zeal of the old war horses that have stood by it for a quarter of a century.

Gathered as we are upon this twenty-sixth anniversary, it is proper that grateful recognition be made of several things in the past. In the first place it is fitting that we note the fact that our membership has largely increased in the past two years. We are glad, also, that this membership, while including men of experience and mature minds, includes also a number of younger men, whose future is largely before them. I shall be glad if what is said here to-day shall prove of special value to such.

Organizations of this kind are of great benefit to the young men of the profession, because they bring them into touch with more experienced minds in discussion, and tend to lead them upward and onward. No young man can truthfully say that associations are of no benefit to him. He who stands on these grounds, and remains outside of the organization, is injuring himself more than he realizes. As a member of such an organization as this, he can express his own opinions freely, and absorb ideas which have a practical value to him, coming from older and more experienced

men. What I admire in young men is an expression of honest convictions. These convictions may not be accepted to-day, but the future may prove their soundness.

It is gratifying to note that some of the charter members, the old war horses, as it were, are still with us, with their valued experience and wise counsel.

We are glad to note the absence of that sensitiveness which seems inherent in some individuals, and whose natures consequently demand some kind of a blow-off as a safety valve to a machine. I have thought many times that these individuals kept a storehouse of unpleasant words and annually came to the convention and dumped them overboard, rankling the best dispositions and hampering the good feeling which ought to exist at conventions that assemble for higher aims. We cannot all think alike. There would be no progress if we did. Because I cannot convince another that my views are correct and his wrong, is no ground for thinking his unsound. In your discussion, gentlemen, let your remarks be so tempered that none can take umbrage.

We are glad to note that the influence of society work and benefits therefrom, have led to the organization of a kindred society, so that we have to-day, in addition to our own, the Southern Wisconsin Dental Association, whose membership includes men from the southern part of the State. In May, of this year, they held their second annual meeting. Any dentist of good standing, morally, is admitted to membership without examination. We should wish them success, and give them all the encouragement possible.

How to increase the effectiveness of the Wisconsin State Dental Association is a matter of vital importance. To-day there are many other practitioners who should be in our ranks, and it should be the duty of every member to assist in securing new recruits from his section of the State to swell our numbers.

Would it not be well, gentlemen, to have a tri-State dental meeting in 1897? Wisconsin, Iowa and Minnesota, for instance, might join in having one good meeting at some point in the western part of the State, and have the representative men in these three commonwealths join in a union meeting. I believe such a course would be helpful to all. The meetings of the American Dental Association are of the utmost value, and it is a blessing indeed to any man who can attend the sessions and listen

to the utterances of veterans in the profession, who regularly give us the results of their original work which they have been doing in a long series of faithful years. But in the nature of the case, for many of us it is impossible to go to the American Dental Association every year. Hence the next thing in value to us would be to have the inspiration of a joint meeting of a group of States. I would recommend that a committee of three be appointed to act with the Minnesota and Iowa meetings, furthering this idea, and also to try and induce the American Dental Association to meet at some point in the West in 1897.

As a profession, we should feel grateful to the Dental Protective Association of the United States for the interest it has manifested in throttling the efforts of patent sharks in securing a foothold by false representation. Many cases have already been won in the courts and many are yet pending. Up to the present time thousands of dollars remain in the pockets of the profession which otherwise would have been extracted by royalties, office rights and licenses. Dr. Crouse, of Chicago, is ably championing our cause, giving time, money and strength for its success. It takes money to conduct cases through the courts, and the profession should awake and join the organization, thereby assisting the cause and protecting themselves as well. I would urge every one who has not enrolled his name on the books of the association to do so at a very early date, and send his \$10 as their funds need replenishing. In order to be a permanent organization the Dental Protective Association must have more support from the profession than has been given it. It has been a large expense to organize this association and carry on its valuable work, and it will be a serious matter to the profession if abandoned.

Speaking of the past naturally reminds us of those of our number who have closed their earthly career. While we tenderly remember such, it is well that we pause here to mention the name of a late honored member of our association, my old time classmate, Dr. Thorwald T. Judd, of Janesville. Well do I remember this departed friend as a popular member and the president of our freshman class of 1881, in the University of Pennsylvania. A successful practitioner for many years in Janesville; he was also first vice president of this association in 1894-95. He passed away suddenly, dropping dead upon the street as he was wending his way home to supper on the 5th of November, 1895. Peace be to his ashes!

We cannot leave the story of the past without referring to one memorable incident in the life of this association and of its present president. It is a fact of more than ordinary interest that we have still with us one honored member whose obituary was actually published a full year ago. How he ever got back to this world does not yet appear, though we are glad to welcome him to this lower sphere again. Let it be understood that the deceased (Dr. Henry A. Palmer, of Janesville,) will always be welcome to our meetings as often as he may find it convenient to return to the earth.

From the past we naturally turn our eyes to the future. The question of the hour to each one of us should be, how may we render ourselves most effective in the time before us? Let me suggest some lines of thought.

In the first place, it is imperative that we give time to original work. Young men just out of schools, fresh from the hands of gifted teachers, are in a certain danger of feeling that they know it all. This is a very grave condition. Of course, as a matter of fact, when a man leaves the college or university, he is only ready to begin professional life. Hitherto he has learned certain principles and certain methods of work. Now he must learn to apply those principles along new lines, otherwise he will soon find himself in a rut and left behind in the march of the profession. Everything depends on his next step. In order to secure success he must at once study up original methods and to make new applications of these principles and methods which he has so laboriously acquired. The young man of to-day is in middle life to-morrow and in old age the day after. Suppose any one of us who has been out of school for ten years, looks back to college days, how short a time it seems, showing how rapidly time slips away. The habits of mind become fixed and the opportunities for learning are quickly passed. Hence the importance that one commence original work and investigation at once. From what has been said we see that it is not only important that young men study new methods, but this is equally true in the case of men who are in middle life, or beyond, since whatever they do must be done quickly. The profession needs the best thoughts and the best work of men of experience. Confidence is one of our great needs. Secure this and be progressive and success will crown your efforts from the start. We can see these things illustrated in other

States, and Wisconsin is not far behind. Is it not true that many of the things we do to-day were unknown twenty years ago? Hence in the nature of the case, if a man is going to succeed he must study, or he will be in the background.

It would be in the line of rendering the Wisconsin State Dental Association more effective if we were to lend our influence in the direction of securing better legislation for the protection of the public against incompetent men. For instance, we have a law which authorizes the State Board of Dental Examiners to grant students and men permission to practice, without examination, between the date of their application and the next regular meeting of the board. This is often a period of several months. While it is true that many of these applicants are competent to practice with credit to themselves and to the profession, yet it is possible for wholly incompetent men to get such permission under the present law. The gifted leader of the Republican House of Representatives in Washington has said, as a result of many years of experience, "That it is exceedingly difficult, and often impossible, to frame a law that cannot be taken advantage of by unprincipled men, unless you so limit it with modifying clauses as to prevent its accomplishing the very thing it was meant to accomplish." This statement of an experienced legislator is no doubt true, yet it is our duty to make the best laws we can. Our present law makes it easy for an unprincipled man to get a footing in a community as a dentist. Let us then do all we can to correct this state of things.

Such, then, gentlemen, are some of the thoughts which I would suggest for your meditation and discussion at this annual meeting.

Let us remember, as we tarry together, and as we return to our work, that ours is a high calling, that our work is closely connected with the comfort and welfare, and hence the usefulness of our fellow men.

We are living in a great and wonderful age, an age of marvelous discoveries along all lines. Steam power, itself so new, is about to be thrown aside in favor of the mightier force—electricity. Machines are taking the place of men. We even set our type by machinery. The voice of the telegraph, telephone telautograph, and the graphophone are heard in the land. All this machinery and these new inventions means that man is to have more time than ever before for thought and progress. In the last few years the science of chemistry has made a complete revolution; the same

is largely true in medicine, and to a considerable extent in theology—in fact in all departments of science.

For us to keep abreast of the times, then, means that we, too, think and do original work.

Let us then, as we go to our homes, remember that if we are true to our calling we shall make grateful recognition of past benefits, we shall ever be seeking better methods and new applications of great principles and thus shall we fulfill the destiny to which Providence is calling us.

PERIDONTAL INFLAMMATION.*

By H. A. PALMER, D. D. S., JANESVILLE, WIS.

Gentlemen of Society: In presenting this paper, I wish it distinctly understood that I am not giving the subject of peridental inflammation a scientific discussion, but would rather bring it before you in a general way, which will provoke discussion and stimulate thought upon this great subject. Since setting myself the task of writing this paper, I have been most thoroughly convinced that there is no question which can come before us as dental practitioners that is of more importance to our patients, than this. If we desire to raise dentistry into the realm of prophylactics, instead of permitting it to grovel upon the lower grounds of prosthetic dentistry; if we desire to become known as those who are able to prevent pain and trouble instead of being simply those who are mechanically capable of supplying a part which has been lost through the neglect of the patient, we will have to give this subject a most thorough study, for it is in a certain sense, the very foundation stone of our structure of mercy and good will to men.

No one knows all about inflammation and probably no one ever will, but let me say that the more we do know about it, the better dentists we will be, and the higher we will lift our chosen profession in the eyes of men.

The definition of inflammation given by Webster, is "redness and swelling of any part of an animal body, attended with heat, pain and febrile symptoms."

Garretson says, "by inflammation is meant perversion of the circulation. By perversion of circulation is implied derangement in that harmonious distribution of the blood to organism at large,

* Read before the Wisconsin State Dental Society.

through which harmony every individual part has its proper share, and has no more than its share."

Inflammation then, in its first stage, is simply an excessive infiltration of blood in the part inflamed. In periodontal inflammation something has caused the periodontal membrane to become overcharged with blood, and a redness, heat, pain and swelling are the results.

There may be very little pain in acute inflammation and other symptoms may differ. The case may proceed so far that active congestion, stagnation and even suppuration may have taken place and the patient not be aware that anything very serious is going on, while on the other hand, a very slight inflammation may cause much trouble. If the people knew these things, there would be many more who would have their teeth examined often that they might prevent the pain and trouble which may follow from a diseased periodontal membrane. Indeed, if we as practitioners fully realized the benefit of prevention in this one class of cases, and could impress it upon our patients, especially the younger classes, we would be much more fully accomplishing the objects of dentistry.

Now, what are some of the causes of periodontal inflammation? There are many, and some of them we are to blame for ourselves, by our carelessness, but they can all be summed up in the one word irritant. Inflammation is caused by irritation. Some foreign substance in the blood itself, gases or septic matter from a dead pulp, filling material forced through the apical foramen, a concussion received from a blow, a hard bite or malarticulation from an overfilled tooth, may be the irritating cause. Wedging or separating the teeth may be the cause of irritation.

The careless use of arsenic for devitalizing a pulp may cause inflammation around many teeth. Ligatures or rings of rubber forgotten after removing the rubber dam, may do the work. Sometimes a little loose amalgam left under the gum margin may cause much trouble. Not long since I reduced quite an extensive inflammation by removing a piece of toothpick which had been forced under the gum and broken off.

These are but a few of the many things which irritate the periodontal membrane and thus leads to inflammation, which is the process that dame nature uses to get rid of the irritant. Nature does not like to see things in the wrong place, so when anything

enters a membrane that ought not to be there she immediately calls upon the circulatory system to help her right things. This system shuts off the offender from the rest of the body by pouring a quantity of lymph around it. That coagulates, compresses the blood vessels, cuts off nutrition, the parts dying slough away, and if possible, carry the offender with them, giving nature a chance to cure the place thus disturbed. Thus we see that inflammation is a means of cure rather than an element of destruction. A segment of tartar, a piece of amalgam or a ligature of silk, has no more business under the gum than a decent dentist who loves his profession and humanity has in a drunk factory, and nature will kindly use heroic efforts to get and keep the offender out, in either case.

Now let us look, for a few moments, at our duty as dentists in this matter which is so common and so important. In the first place let me say that it is our duty to use prophylactic means as far as possible, and we can do this only by educating the rising generation in every way known to us. Cleanness is the greatest preventive known to us. There is nothing more beneficial than to teach a child that he should keep his mouth clean, literally as well as morally. If I can have the care of a child and he will obey my instructions, I can safely guarantee, barring accidents, that he will never have a case of peridental inflammation.

If that dream given in the *Items* sometime since, where the dreamer was placed forward fifty years, to the time when every child attending school was required to present to the teacher before entering his classes, a card from some reputable dentist, showing the exact condition of his teeth, could become a reality, there would soon be less of this peridental trouble among the people. A habit of consulting the dentist would ensue, and he could advise preventive measures that would accomplish great good. The question is, how shall we accomplish these things under existing circumstances. Will the society please answer?

Much can probably be suggested and accomplished. Indeed, I expect that the years of the future will bring about a great change in these things, but inflammation still exists; what shall we do with those cases that come to us in their various stages of development. I think that the very condition of the parts inflamed suggests the remedy. The cause must be removed. If tartar, though it be of ever so small a quantity, be the irritant, remove it, and do

it thoroughly. A little good mouth wash and nature will complete the work. If rock candy or hickory nuts have been the active agents, forbid their farther use, and aid nature a little by applying a counterirritant to the gum. An application of iodine, aconite and chloroform, followed perhaps by a dental plaster at night, has often reduced inflammation for me. Sometimes a little grinding of the filling or tooth has given relief. If taken in time a very simple remedy will accomplish the work, but in cases where through dread, caused by ignorance and the vivid imagination of some eloquent friends who have passed through the hands of a quack, the inflammation has passed on beyond the simple state, more heroic measures must be used. It is better for the patient to lose a grinder than to be disfigured for life, or possibly be called to try the relatives of the great unseen.

Let me close this paper by suggesting that we give this subject a thorough study. That we teach the people the necessity of cleanness and the care of the teeth. That whenever a case of peridental inflammation presents itself, remove the cause, assist nature all we can and in her kindness she will undoubtedly do the rest.

ABSCESSSES, THEIR CAUSE AND TREATMENT.*

A. H. PECK, M. D., D. D. S., CHICAGO ILL.

An abscess is a collection of pus in the tissues, says an eminent pathologist, the formation of which is always preceded by a circumscribed suppurative inflammation, whereas, the accumulation of pus in a preformed space, such as the pleura, pericardium, pelvis of kidneys, etc., although resulting from a suppurative inflammation of the walls lining the space, is not by general custom and usage, called an abscess, but the presence of pus in any of these organs is indicated by the prefix *pyo*, a Greek word, which in combination with the name of the anatomical locality signifies connection with, or relation to pus—thus *pyo-thorax*, *pyo-pericardium* and *pyo-nephrosis*, respectively.

The histological conditions present at the time of the commencement of pus formation are characterized by a richness of leucocytes in the connective tissue between the inflamed capillary

* Read before the Wisconsin State Dental Society, at Madison. July, 1896.

vessels and the compression of the preëxisting tissue cells by them and the transuded serum.

Thus it is at once apparent that before an abscess can be formed, the affected area must pass through all the stages of the inflammatory process, a discussion of which, in this paper, time will not permit.

Says Dr. Black, abscess is the result of a severe but circumscribed inflammation, which causes the destruction of a certain area of tissue; or leucocytes may collect in large numbers at the center of the focus of the inflammatory process, and being reduced to a very low state of vitality, become aggregated together, and cause a separation of the tissues, thus forming a *pus cavity*. Tissue, to a greater or less extent, being destroyed in the focus of the inflammation, and becoming dissolved, or being formed into small gangrenous masses, mingles with the fluid and corpuscular exudates to augment the volume of pus.

Simultaneously with this action is the tissue in the immediate vicinity being infiltrated by the exudation of coagulable lymph, thus forming the so-called abscess wall, beyond the limits of which infection does not extend.

There is one positively essential element to the formation of pus not yet mentioned, and that is the presence of the pus microbe. The *staphylococcus* almost invariably being found in circumscribed abscesses, while the *streptococcus* variety is more prone to cause diffuse purulent infiltration of the tissues. These germs may be brought in contact with the affected part from external sources; but more frequently this is accomplished through the medium of the circulation of the blood and the lymphatic system. How many of us have stopped to consider all that is taking place, or has taken place within the tissues, when on opening a tooth we find just a globule of pus in the space formerly occupied by a single horn of the pulp, that the affected part has undergone all the pathological conditions attendant upon the formation of the largest abscess that has ever, or may ever invade any part of the human organism? To me this is, indeed, a most fascinating study, and I fain would say more upon it.

Abscesses are classed as *acute* and *chronic*, according to the character of their discharge, causes, and the time which elapsed between the commencement of the disease which caused them, and their formation.

Acute abscess, being the usual result or termination of acute circumscribed suppurative inflammation, and contains the characteristic yellowish, creamy pus. It appears within a very few days after the commencement of the inflammation, and reaches its maximum size in a short time.

The chronic variety generally speaking is usually traceable to some specific chronic inflammation, generally of a tubercular nature. As we apply the phrase in dentistry, it means an abscess of long standing ; one which has become complicated with other troubles, such as the accumulation of serumal deposits, or carious bone, or both, and which do not yield readily to treatment. An abscess occurring within the alveolus in no way connected with the teeth should not be referred to as an alveolar abscess. Only that having its origin in the apical space and being dependent upon the death of the tooth's pulp should be termed alveolar abscess.

The cardinal principles to be observed in the treatment of any abscess, whether general or alveolar, are free evacuation of the pus, continued and adequate drainage in connection with proper aseptic treatment. When it becomes necessary to incise an alveolar abscess for the purpose of drainage, the incision should be made in all cases when it is practicable at the most dependent point of the pus sack, said opening should always be large, not small. Having freely drained the pus by careful digital manipulation, and the tooth is not too tender to continue the work, all debris should be thoroughly removed from the root canal or canals, as the case may be, and the opening through the end of the root made positive. Carbolized tepid water should be forced through the entire tract in sufficient quantity to thoroughly cleanse the pus cavity. I prefer carbolized water for this part of the cleansing process, chiefly because of the soothing, anæsthetic effect that the carbolic acid imparts to the soft tissues involved.

This should be followed by a similar use of peroxide of hydrogen, or of a 3 per cent solution of pyrozone, according to the operator's liking. A thread of cotton saturated with a suitable antiseptic (and it doesn't matter so much what the agent is) should be placed in the root canal, and the cavity sealed. If the work thus far outlined is thoroughly done, nine out of ten, and I feel safe in saying ninety-nine out of every hundred cases of acute alveolar abscess will heal without further interference, either surgical or medicinal, provided the systemic conditions, the recu-

perative powers of the tissues involved, approach anything like the standard that is normally expected of them.

If the inflammation of the different parts is so intense as to render impracticable further work than the mere evacuation of the pus at the first sitting, the edges of the incised tissues may be saturated with a moderate amount of carbolic acid, 95 per cent, which will prevent the healing of the opening for some days. Dismiss the patient until the inflammation and the tenderness subside.

In cases of blind abscess, it is necessary to evacuate the pus through the medium of the root canal. Sometimes this form of abscess causes a great deal of trouble to the operator. When connected with the root of a tooth whose canal is small and tortuous, oftentimes it seems impossible to effect an opening through the foramen of sufficient size to allow free, unimpeded drainage. Having failed by the use of all other means to effect the desired opening, I never hesitate to make use of the sulphuric acid treatment—the *modus operandi* of which has often been discussed in the journals and also before this society.

The necessary opening gained, the treatment resolves itself in the majority of cases, into a very simple matter. The pus will readily flow through the foramen into the root canal where it may be wiped away. The evacuating process should be facilitated by gentle, firm pressure with the fingers on both the lingual and labial or buccal surfaces of the alveolus opposite the pus pocket. This should be continued till the pus has been completely removed, or as nearly so as is possible.

Having wiped it from the canal with absorbent cotton the tract should be thoroughly cleansed with peroxide of hydrogen, care being exercised not to force an undue amount through the foramen into the abscess cavity. The canal being thoroughly dried, an antiseptic on cotton should be placed into it, and with some pressure, so as to force the medicament through the foramen into the pus cavity. The tooth should be sealed tightly in the majority of cases, and the patient dismissed for a day or two, or a week, according to the nature of the case.

Only in the very worst forms of this trouble, those in which I am satisfied that gases will continue to be generated would I fail to seal the cavity tightly. This form of treatment must be gone through with as often as may be necessary to effect a cure. Oil of

cassia is an excellent agent for the treatment of these cases. Dr. Black's 1, 2 and 3, is a most excellent remedy. I have had exceedingly good results from the use of terebene and terpinol. There is nothing better than carbolic acid. Having failed with all things else, more than once I have effected a cure with it. I have used it many times first and only, and am positively convinced there can be no doubt about its efficiency. Notwithstanding many decry its use, and especially so in the treatment of blind abscesses.

Abscesses with fistulous openings, except they be of long standing, and have become complicated with other difficulties such as the accumulation of serumal deposits on the apex of the root, or the inner surfaces of the bone throughout the diseased tract have become carious, usually yield very readily to proper treatment. Having cleansed the root canal, and made the foraminal opening positive, carbolized tepid water should be forced through the tooth and fistule in sufficient quantity to carry away the pus that may have previously accumulated along its route. This may be best accomplished, perhaps, with the hypodermic syringe, using a blunt pointed, flexible needle, preferably gold or platinum. To prevent the medicinal agent from "backing up," so to speak, thus defeating the desired object, warmed gutta-percha should be tightly packed about the syringe point in the cavity in the crown of the tooth. After which, oil of cassia, terebene, terpinol, oil of winter-green, eugenic acid or eugenol, oil of sassafras, Black's 1, 2, 3, or carbolic acid 95 per cent, according to the preference of the operator, should be forced through the fistule. The last named drug is my favorite for the treatment of these cases. It may effectually and safely be used in the following manner: A broach wound with cotton serves to convey the agent to the root canal, thus, having placed a considerable quantity in the latter, a cone-shaped piece of vulcanite rubber is pressed into the cavity, and with a suitable shaped, smooth pointed instrument, the medicament is forced through the canal and the fistule.

A great quantity of the remedy is not necessary and should not be used, only enough to thoroughly saturate the fistule throughout its course and to whiten the edges of the soft tissues at its opening. When thus using this agent a bottle of glycerine should be placed near by, in case an undue quantity of the acid should pass through the fistule and spread over the soft tissues, that they may immediately be saturated with the glycerine which

acts as a prompt antidote to the escharotic effects of the acid. This done a mild antiseptic on cotton should be sealed in the cavity, and the patient dismissed for a few days. Future treatments, and the time that should elapse between them, must be left to the conditions of the individual case and the operator's own good judgment. If the abscess is complicated with serumal deposits or carious bone, surgical interference becomes necessary. Some will say, why not use stronger agents to dissolve the deposits and the carious portions of bone, thus permitting them to pass away through the medium of the fistule, (aromatic sulphuric acid being the typical remedy advocated for this purpose). While this agent is a powerful stimulant and a most excellent one to use in those cases that are slow to recognize the therapeutic effects of the milder remedies, because of a low state of vitality, at the same time I am thoroughly convinced that its much advocated *dissolving* properties under these conditions amount to almost naught.

Becoming satisfied that these complications exist, no hesitancy to enlarge the opening in the soft tissues and the bone for the purpose of removing them should be manifested. The opening should be made large enough to permit the operator to work freely and thoroughly. The deposits and the diseased bone, either or both, having been thoroughly removed, future treatment is comparatively simple. All the parts must be kept thoroughly cleansed with a mild antiseptic, and it doesn't matter so very much what it is. The opening may be caused to heal from the bottom by the use of a carefully fitted plug of paraffine wax. A layer being removed from the inner end of the plug from day to day, thus causing the granulation tissue to form from the deeper portion toward the surface.

In cases of long standing where the apex of the root has become completely divested of its soft tissues, and covered with deposits and is being wasted away by the process of absorption, it is necessary in most instances to excise the end of the root before a cure can be effected. In event of this operation the root canal should previously be filled. Future treatment being conducted similar to that of the previous case.

Electrozone, or meditrina, which is nothing more nor less than purified sea water *electrified*, is one of the very best agents for destroying offensive odors so commonly encountered upon opening

teeth with abscesses. Indeed, there is no remedy in the entire *materia medica* that is any better. In cases of sluggish, chronic abscess, if injected through the fistule this agent seems to revivify the dormant vital forces, and to impart new tone and resolution to the tissues throughout the entire tract.

In connection with the various forms of local treatment outlined, in many cases it becomes necessary to resort to systemic treatment as well, if we would hope for the best possible results and also would render the greatest service to our patients.

Frequently, the patient is suffering intense pain, neuralgia in its most exasperating form is not an infrequent accompaniment; the assimilative and eliminative organs are by no means performing their functions; the patient naturally enough, has little or no appetite; the circulatory system is badly out of order; in short, the patient is not feeling at all well.

The dentist, who is quick to perceive all these unnatural conditions, and who is capable, and does prescribe intelligently, successfully for these various systemic complications, is the eminently successful practitioner of to-day, and the one whose services are sought after, and thus made valuable.

Great benefit is derived from counterirritation; the application of hot lotions, the administration of fluid extract of tonga, antkamnia, codeine, quinine, Dovers' powders, hot footbath, and a night of perspiration for the local inflammation and the neuralgia.

Diuresis and cartharsis must not be overlooked. It is very difficult, indeed quite impossible, to follow an ironclad course of treatment, either local or systemic. One must be guided entirely by the conditions present in each individual case.

Further development of a threatened abscess may easily be stopped, even after considerable swelling has taken place, and the patient has suffered excruciating pain, by thoroughly removing the contents of the root canal, and opening the foramen into the apical space. This permits the gases that are being generated, to escape. The canal should be thoroughly cleansed, and no better remedy for this purpose may be used than a 1 to 500 per cent solution of bichloride of mercury in peroxide of hydrogen. Having dried the canal, a mild antiseptic on cotton should be inserted, leave the cavity in the crown unsealed, that gases which may be further generated shall have easy means of escape. Dismiss the patient for two or three days. The pain will cease almost immediately

upon opening the foramen, and the swelling will subside in an incredibly short time.

Success in the treatment of abscesses depends very largely upon the thorough execution of every minute detail of the operation, otherwise, failure should occasion no surprise.

A CASE OF MAXILLARY FRACTURE.*

BY DR. O. C. MOON, BEAVER DAM., WIS.

We are all of us familiar with fractures of the maxillary bones, theoretically. But as dentists, most of us only see the practical side of this subject occasionally.

Accordingly when a case of fracture does come into our hands for treatment, we are apt to be somewhat at a loss as to the best method of managing it.

Dr. Garretson has said that in all of his practice he never treated two cases of fracture of the maxillary bones just alike. In other words there is no cast-iron rule of treatment of these cases, but each must be handled according to the best judgment of the operator.

What is required, aside from any treatment of the soft parts needed, is some appliance, the simpler the better, to hold the parts in place till nature can perform the cure.

In a case of simple fracture usually but little ingenuity is required to arrange a suitable appliance, but in complicated cases you will often find ample use for your thinking cap.

I was called on last summer to assist in the treatment of a case that interested me greatly, and with your permission will give you a brief account of it :

Miss S., a teacher in the public schools of Beaver Dam, while passing along the street on the fourth of July, was struck in the chin by a piece of iron which had evidently been fired from a toy cannon.

It struck a little to the left of the median line, and, cutting through the bone, plowed its way along the lower and inner edge of the bone, badly lacerating the floor of the mouth, the submaxillary gland and root of tongue, and imbedded itself in the neck, back of and a little to the left of the trachea.

Dr. Mackey, of Milwaukee, was immediately telegraphed for

* Read before the Wisconsin State Dental Society.

and came out that evening. He found a piece of the bone gone the entire depth of the jaw and perhaps three-fourths of an inch in width, together with the left central, laterals and cuspid teeth.

The lower edge of the bone on the left was also splintered somewhat with a great many small fragments loose in the wound. The small loose particles were removed and an effort made to find the missile.

It was found impossible, however, to locate it without running too great risk and so was left for the time.

The wound was dressed carefully and the two ends of bone fastened together with a silver wire. This not proving sufficiently firm, I was called in and wired the adjoining teeth together as an additional support. Still further support being given by a splint and bandage under the chin.

The case was then left in the charge of a local physician.

Even after the ends of the bone were brought together as well as possible there was still a space in the lower part large enough to insert the finger and through this, partially, the wound was dressed.

After a few days it was found that there was a strong tendency to vertical displacement, the shorter section on the left being inclined to draw up and the other part down, by the action of the muscles.

To overcome this I fitted, as best I could, a narrow plate of aluminum to the lingual surfaces of the lower teeth. This was then lined with a thin coating of gutta-percha, and while warm pressed into place and wired to two or three teeth on each side of the fracture.

This answered the purpose nicely for a time, and permitted the proper treatment of the wound in the soft parts of the mouth.

On the twelfth day the bullet or slug worked into the throat and was recovered, much to our satisfaction.

It was then found to be a piece of iron three-fourths of an inch by one-half inch in size with a curved part or hook at one end, and the wonder is that it could pass so deeply into the neck at the point it did without doing more serious damage.

Soon after this the teeth to which the plate was attached began to loosen from the continual strain upon them, and it became necessary to resort to other means of holding the parts in place.

Heretofore it had seemed necessary to be able to get to the

interior of the mouth readily in order to keep it in an antiseptic condition. The soft parts were so badly lacerated, including the submaxillary gland, that it was necessary to make frequent and thorough use of antiseptic washes. Now, however, the interior of the mouth was healing so nicely that I decided to put in an interdental splint.

This was made by taking an impression of the upper jaw, and making a rubber plate for it, extending over the molars and bicuspid, and with enough thickness at the edges to prop the mouth open somewhat. This was then tried in the mouth and the thick portions dressed down till the lower teeth rested firmly against them with the broken parts in their proper relation to each other.

The thickened sides of the plate were then roughened somewhat and pieces of gutta-percha softened and moulded onto them, and the splint with gutta-percha still warm, placed in the mouth and the lower teeth pressed up into place—the aluminum plate having been previously severed. When the gutta-percha was cold, a four-tailed bandage around the chin and over the top of the head was all that was necessary to hold the parts in place, and the space between the upper and lower teeth in front was ample to allow the taking of food and for further use of antiseptic washes.

The bone being held firmly in place, united without further trouble, but such a large section being lost, the jaw is now, of course, much narrower than before, and the teeth do not antagonize with the upper ones, but close entirely inside of them.

The chin having been originally rather broad and prominent, the reduction in its width really detracts but little from the general appearance of the face. But the teeth failing to antagonize, are left more ornamental than useful, and like the mills of the gods, grind but slowly.

This trouble has been partially overcome by making a plate without teeth, fitted to the roof of the mouth and thickened at the edges to antagonize with the lower teeth. This answers the purpose fairly well.

I should like, however, the advice of the society as to what further should be done. Should it be left as it is, or would it be advisable to extract either the upper or lower teeth after a time, and put in a plate with teeth set so as to articulate properly with those of the opposite jaw?

I should like your opinion also as to whether it would have been possible to fill in all the lost portion of jaw with new bone.

The lower teeth could, of course, have been articulated properly with the upper ones and then wired into place, thus holding them firmly and allowing food to be taken through the space left by the three missing teeth. But if this had been done, could nature have done the rest? Would it have been possible to fill in so long a space with new bone? For any suggestions on these points I shall be under obligations.

SOME POINTS IN THE MANAGEMENT OF ENAMEL MARGINS.*

S. A. NIELSON, D. D. S., MADISON, WIS.

The importance of thoroughly understanding the different positions of enamel rods in relation to each other, and to the dentine which supports them, cannot be overestimated; for without this understanding, one of the most vital points in the preparation of any cavity, is left to mere chance. What benefit if we may get perfect retention and perfect adaptation, if the enamel margins are left unsupported and unprotected to crumble away beside a most solid filling. Such, indeed, is the case, where the enamel margins are not cut far enough away to prevent recurrence of decay, and not so shaped as to be protected by the filling. "That a chain is not stronger than its weakest link," we all know, then why not make every part, in the preparation and filling of a cavity, so that it will stand a strain equal in proportion to every other part, thus making each part bear in proportion to every other part, its share of the burden.

I do not propose in this paper to speak of the composition of enamel, or discuss the lines of junction of enamel plates in all the different teeth, or how the enamel margins of the several teeth should be formed; but will treat especially of the lower molars, since in these teeth, according to my observations, errors most frequently occur.

The enamel covers the crowns of all the teeth, is the hardest tissue of the body, and is composed of crystalline rods cemented together, forming a solid cap. Fig. 1 being almost a complete

*The doctor's paper was illustrated by numerous microscopic sections, the cuts for which were not received in time for publication.

section of a whole tooth, I use simply to show the general position of the enamel rods in relation to the dentine which supports them, they are placed with their ends upon the dentine, and extend toward the outer surface of the tooth. In the molars as a rule, the enamel rods do not follow a straight line from the surface of the dentine to the surface of the enamel, but are more curved and mixed.

We are all familiar with the fissures or lines of union between the plates of enamel in the lower molars; that each cusp represents the starting point of an enamel plate, and that when these plates have begun to form, the dentine has not the shape of the full grown tooth, but as the enamel plates enlarge, they are carried farther apart by the growth of dentine until the size of the crown is reached, then the margins of the enamel plates come together and coalesce, seldom if ever making a perfect union, but leaving a fissure, sometimes extending almost to the dentine, and often only part of the distance through the thickness of the enamel, varying very much in this respect; frequently no fissure at all can be detected by the naked eye, still it will be found on microscopic examination that the union of enamel plates in such cases is not perfect. The enamel rods will be found to be mixed or entwined into one another, and have but little strength. Fig. 2 is a drawing from a section of a lower molar, showing the buccal groove or union of enamel plates; a. a. represents the enamel rods proper, b. the enamel rods at the union of enamel plates.

Fig. 3 is a drawing from a section of a lower molar, showing fissure between disto-lingual and disto-buccal cusps; c. c. represents enamel, d. fissure.

In teeth with prominent cusps, the fissures are more marked, and in such cases extra care of the enamel margins is necessary. In drilling or cutting out such fissures a flat drill should not be used, or any bur, ground flat—a thing often done to make them take hold as we would say, for if fissures are cut out in this manner the tooth is liable to fracture, and liable to split mesio-distally, since it is found that in cutting the enamel with a chisel there are definite lines upon which it will split, owing to the fact that the enamel rods split away from each other more easily than they break. Fig. 4 represents enamel after being split away, as can be seen under the microscope.

Fig. 5 represents occluding surface of lower molar, black line

represents fissure or lines of union between cusps, heavy black line the enamel margins after cutting out fissure. At points 2. 2., being the termination of fissure running bucco-lingually, the cutting should be deeper and wider, thus making anchorage to prevent splitting of tooth,

The enamel margins should be beveled, care taken not to make too great an angle, as represented in Fig. 6; neither rounding as shown in Fig. 7. The reason being very evident that margin of filling would be weak at this point, being too much of a knife edge.

The enamel margin should be cut on an angle of about 45° as shown in Fig. 8, thus leaving the enamel well protected, and also maintaining the strength of the margin of the filling. It will also insure a more even outline of cavity after being filled, since there can be no thin edges to tear away as would be the case if cut as represented in figures 6 and 7.

The angle of enamel margins should be cut with a sharp chisel, when this is not possible, a sharp finishing bur. Am sorry to say that I have looked in vain for such as I would recommend, since all I have seen are rounded, when in fact they should be cut on definite angles. A disk in the engine should not be used to bevel enamel margins, as it invariably leaves them rounded.

Turning now to the consideration of approximal cavities, I represent in Fig. 9 disto-approximal cavity in lower molar, taking in part of occluding surface. To illustrate the point I have in view I will call your attention to drawings made from sections No. 10 and 11, showing position of enamel rods in disto-lingual cusps. It will be seen that the surface of dentine supporting enamel rods is shorter than outer surface of enamel, which position, cusps being intact and whole, insures greatest strength, same as an arch of masonry; but if part of cusp be destroyed by caries or cut away, and not sufficient dentine left to support remaining enamel rods, a weak spot is inevitable, and enamel margins will break down. In such cases the cutting away should be extensive enough to prevent such breaking down of enamel margins; this often means the cutting away of nearly the entire cusp. The same applies to buccal cusp.

Another reason for extensive cutting away of margins in approximal cavities is to get the line of contact between filling and enamel margin away from the point of contact between the tooth being filled and its fellow, thus preventing in a great degree the recurrence of decay at enamel margin.

SYSTEMIC MEDICATION IN DENTAL PRACTICE.*

BY JOSEPH W. BOISOL, D. D. S., BLACK RIVER FALLS, WIS.

In presenting for your consideration and discussion the subject of systemic medication in dental practice our object is to bring before this society a matter which has, I think, been sadly neglected by the dental profession.

When cases come under our care we are liable to rely upon a mere mechanical operation, or at most a local application, when we might call to our aid numerous remedies, which would materially aid us, and in many cases save our patients hours of suffering.

We seem to forget that the teeth are a part of the anatomy, as susceptible to the action of systemic treatment as are the other organs of the body. While it is not our purpose to enter into the therapeutic value of all the medicines that may serve our needs we will endeavor to point to a few remedies which have proven of much value in our own practice.

It might be proper to state that the remedies to which your attention is called are not confined to any one school of medicine, as to our mind it were more human as well as more scientific to employ the agent which will give the best result regardless of their pathy rather than condemn that of which we are in ignorance merely through prejudice. When first prevailed upon to use some of the remedies of the homœopathic phamacopœia it was done with reluctance and little faith in their efficacy, but the results were a surprise, and revelation which compelled us to give credence to the law of similars, and what was of far more importance, saved much suffering and in many cases the tedious operation of treating alveolar abscess, as it is now an ordinary occurrence to abort abscess with a few doses of hepar sulph (sulphide of calcium,) the 200x dilution as prepared and used by the homœopathic school of medicine. It is a well known fact that the same remedy when given in doses of $\frac{1}{16}$ grain will hasten the formation of an abscess in any part of the body. Why the 200x dilution should have the opposite action to the $\frac{1}{16}$ grain dose is something I cannot explain but have seen it verified often enough to know to a certainty that the different preparations of this drug are sure to act as here stated.

In the treatment of those most annoying diseases of the periodontal membrane it has been our habit to use alkalithia or tartarolithine (MCK and R) alternated with some one of the remedies to which the symptoms might point.

* Read before the Wisconsin State Dental Society.

If from ptyalism nitric acid 2x or 3x dilutions to antidote the effect of the mercury and followed by silicia 3 to 30x sulphur, calcarea carb. or calcarea phos., as the symptoms may indicate to effect the cure. The medicine to suit the particular case can only be selected by giving careful attention to the symptoms; some of the symptoms calling for silicea under the condition referred to, are: All the teeth feel long and loose, throbbing toothache, swelling of periosteum, worse at night, preventing sleep, gums very sore, with acrid discharge.

Sulphur would be indicated when the teeth are very sensitive to cold water and feel long and loose, the gums being swollen with beating pains in them. Sulphur would be the preferable remedy when the case is one of long standing or where the discharge has a very offensive odor. I wish here to refer briefly to toothache in pregnancy. If we can avoid the extraction of teeth from a patient when in this condition and relieve her suffering by other than mechanical means we are certainly performing a humane act.

Toothache is a very common and very distressing accompaniment of pregnancy, being in fact only a particular form of neuralgia. Good authorities strongly advise against extracting the teeth in such cases, since abortion has been known to follow the operation. Tyler Smith states that they ought only to be extracted with great caution under such circumstances. But those having in their hands the homœopathic remedies, and blessed with even a moderate amount of skill in administering them will never be tempted to resort to a practice at once barbarous and dangerous. Still it must be borne in mind that neither local applications nor remedies selected with reference to the teeth alone will suffice, in many cases, to remove an affection which is at once painful, sympathetic and constitutional—that is connected with some individual idiosyncrasy. Here, as in all other cases of disease, the remedy should be selected in accordance with the totality of symptoms. One or other of the following remedies, of which I will give the symptoms, will usually be found efficacious.

Arsenicum. Periodical toothache, occurring most frequently at night, when it is unbearable and drives the patient almost to frenzy. She is unable to remain in bed and must get up.

Belladonna. Pains as if caused by ulceration, worse after lying down at night or in cold air. Pains mostly on the right side of the face, extending to the eye. The pain causes moaning and weeping. Throbbing pains.

Calcarea carb. The pain is aggravated by the slightest change, as from a current of air, whether warm or cold, drinking anything warm or cold, noise, mental excitement, etc.

Chamomilla. The pains are perfectly unbearable, and give rise to much irritability of temper and impatience, redness of one cheek, while the other is normal or pale; jerkings in the teeth.

Gelsemium. General nervous excitement or weak and trembling. The pains come in paroxysms, are decidedly neuralgic, and dart through the jaws and face, congestion of the head and face.

Hyoscyamus. Violent tearing and pulsating pain, causing spasmodic jerks of the fingers, hands, arms, facial muscles, spasms in the throat, etc. Often delirious with the pain.

Mercurius. The teeth feel sore to the touch, so much so that pressing them together, as in eating, increases the suffering. The teeth feel elongated and as if loose.

Pulsatilla. The pain is better when taking cold food or drink or upon exposure to cold air and is worse from warm food or drink and in a warm room. Inclines to tears. Can't lie down.

Staphisagria. The teeth grow black, become carious and brittle. She is very sensitive to either mental or physical impressions.

Other symptoms may be present which would suggest other remedies than those enumerated, as the indications for these were only given to illustrate the importance of inquiring into the general condition before selecting a remedy. Although we as dentists are not so often consulted regarding the difficult dentition of children as are our brothers, the general practitioner, it might be well for us to educate the laity and also the medical profession generally, to look to us for the alleviation of the sufferings of the little one in such a case. It has been stated that among children 33 per cent die before reaching their second year, the mortality being largely due to teething.

Though the period of teething is not necessarily one of illness, yet there are certain disturbances of health so common at that time that we can anticipate their appearance and lay down rules for their treatment.

Dribbling of the saliva from the child's mouth is usually the first intimation that the teeth are coming, but some weeks may elapse before the tooth appears.

Widening and swelling of the gums, irritability, keeping the

fingers in the mouth, and biting the mother's nipple or that of the feeding bottle, as the case may be, are certain indications of the approaching eruption of the teeth, which may be accompanied by such symptoms as thirst, restlessness, wakefulness, hot, dry skin, flushed cheeks and hurried or irregular breathing. Convulsions may come on without warning, but are generally ushered in by twitching of the lips and facial muscles, twitching of fingers or toes and jerking of limbs.

The convulsive attacks may pass off quickly or return in rapid succession, and be followed by partial paralysis. As an auxiliary measure in such cases lancing of the gums or slightly scarifying them will often give relief.

The medicine that will be most useful in the treatment of irritability, etc., are: Aconite, belladonna, chamomilla, coffea, heliborus, pulsatilla and others, according to symptoms. Convulsions will require belladonna, chamomilla, cuprum, hyoscyamus, ipecacuanha, nux vomica, opium, camphor and others, as indicated by their symptoms.

The mode of administering and frequency of repetition of the medicine must depend largely upon the state of the child. The quantity should not be large, if of a solution half a teaspoonful. In cases of irritability, etc., the dose should be repeated at intervals of from half an hour to three and four hours, according to the urgency. In convulsions, or while they threaten, a dose may be given every five or ten minutes until improvement begins.

In mixing medicines for children if the third or sixth decimal dilution be used, two or three drops of the liquid to nine or ten teaspoonfuls of cold water, and well mixed by pouring from one tumbler to another. Perhaps the most common ailment that we are called upon to treat is toothache in general, the various causes and kinds you are all familiar with. Every day it is becoming a more common practice for me to depend on internal treatment for this trouble. Among the remedies which I most frequently use, and which are always close at hand, are: Aconite, coffea, chamomilla, nux vomica, belladonna, mercurius solubus, spigelia, staphisagria, pulsatilla and others, as indicated, all of the third decimal dilution.

I would earnestly recommend every member of this society to procure some good work on homœopathic materia medica, study it carefully and prescribe such remedies as are indicated for each in-

dividual case, and I feel sure you will say that your time has been well spent and that your clientèle will bless you for having at your command such a ready means of relief.

DENTAL ETHICS.*

BY W. H. CHILSON, D. D. S., APPLETON, WIS.

It has occurred to me that something may be said upon the oft mooted question of dental ethics which might profitably engage our attention for a short while.

Unpleasant though it may seem, to refer to the estrangement or constraint that exists between dentists, yet it is deemed necessary to have a clear discussion upon this matter and look about for other reasons than that of being "down in the mouth."

It is said, and is undoubtedly true, that the opinion of the people is always right, when they are agreed as a unit. Were they a unit in their appreciation of dental skill, we naturally infer that they would require the highest order of dental services, for we believe that dentistry really does what we claim it does, that is, it allays one of humanity's greatest woes.

So long as this constraint is allowed to exist between us, its wedging influence will assist dissensions to creep into our professional ranks greatly to our own detriment. This wedge will be struck in turn by the advertiser, calamity howler, regular practitioner, and worst of all, some of the people. How to remove this obstruction in a measure is the purpose of this paper, and to this end I would recommend a careful study of the code of ethics, that we may apply its precepts to our conduct toward one another. We have not given this subject the consideration in the past that its importance requires, and I verily believe that had we stood on higher ground individually, that we would have much less to complain of. All along our code has been plain, consistent and reliable, telling us in unmistakable terms that which we should not do, and leaving to our skill and honor as professional gentlemen to infer that which we should do. Too many have construed our code in its relation to fees only, neglecting entirely its broader meaning which admonishes us to keep always in view the ethics of man to man.

If our conduct was of such a character as to always be up to

* Read before the Wisconsin State Dental Society.

the standard of our code, the matter of fees particularly would be a secondary consideration, because the fraternal feeling that this inculcated would make it well nigh impossible for any one to depart from a course that had been accepted by the masses of our profession. Tearing down what others so nobly built up in our profession is the result of that wing of the profession which we style advertisers. It goes without saying that there is no iron-clad rule by which all may govern their conduct in practice and meet the requirements which confront us when "skill versus charges" is the particular phase which we have to consider. At this juncture professional character and dignity assert themselves, without which we are as helpless as though devoid of skill.

It is not overstating the case however, to say that we are largely estimated by our fees; that is the sensible people know that something cannot be had for nothing, and are therefore willing to pay a price commensurate with the value of the work. It may be well said that those who maintain fair prices through all this attempt of advertising to degrade them, must have some professional character and skill, and are therefore entitled to a fair fee for honest services rendered.

Good results in our profession come from study, experience and skill, and these can only be obtained by a large expenditure of time and money. When thus equipped the people are not slow to recognize ability and to assign one to his proper position in society.

We are at a loss to understand just what rule of equity the so-called advertising dentists apply to their patrons and be just to themselves, for to cheapen an object when it is poor at its best, as an inducement for the patronage of the public, and that they may also cut the price of their competitors, is a snare and a delusion. To claim by advertising to produce just as good an article as a skilled man for half the price bears deceit on the face of it, and the logical conclusion is that they are unable to serve patients as they claim they do.

Shakespeare has said "the attempt and not the deed is what confounds us." If one should really believe from the depths of his own conceit that a good article worthy to be compared with the best could be furnished at a less sum than its standard must in the very fitness of things be disappointed. The consumer who covets the very best services at fees less than is necessary to de-

cently support the operator, his dependents, their dignity and culture, merits inferior services at twice their value. To illustrate how much labor, skill, time and material can be put into a set of teeth which are advertised at from \$2 to \$8 per set and leave a margin for sustenance? Indeed, I not dilate upon this thought to convince you that there is something wrong. We see advertisements which read something like this: "At the Boston parlors — Sets of pearly teeth made by the best workmen for \$2 and guaranteed for ten years. Teeth extracted in the morning and new ones put in at night; beware of cheap advertising dentists."

I feel very much like characterizing them as cheap and nasty, and feel very much like knocking the spots out of the — — —. There are too many in this world that try to get something for nothing, and this is the class that study the advertisements of the cheap-johns, and under the illusion thrown about them they spread the gospel of the quacks.

On the other hand, too many have entered the dental profession with the idea of becoming wealthy in a few years, at least at the expense of higher and more worthy ideals, but the thought that any one can become rich in a few years in the practice of dentistry is a delusion, pure and simple. It matters not what kind of schemes they resort to in the meantime to induce patronage, in the end they have only humiliation to suffer and a crushed ambition to contend with. They that start out with the idea firmly in mind, that it is quality and not quantity which wins, will surely make themselves felt as a power for good. He who seeks to elevate his calling and does it by constant industry, coupled with the requisite skill, will do so beyond all cavil, and his superiority will be demonstrated and his reward will be sure and constant.

In such a professional course there is pleasure and profit, for it not only brings one a competency for one's dependents in the time that one works, but also brings a fair sum for old age. This then is ethical because the higher and nobler aims of life have been ours.

It is said that of the twenty thousand dental practitioners in the United States, that only about five thousand belong to the dental society, which shows an alarming indifference to professional interests that is difficult of explanation. That the greatest benefits

are derived from society efforts, goes without saying, which alone should be sufficient inducement to any dentist to join the good work.

We often hear it said in these depressing times that there are too many dentists occupying the field of our labors, and not enough demand for our labors to give us a living, but the facts when supported by figures seem to give them no small amount of comfort. The following demonstration I trust will be so clearly put that it will carry conviction to your minds. As a basis for my calculations I have taken the population of the county in which I live and the number of dentists therein, approximating their incomes as near as possible, and find that there is more than $\frac{3}{4}$ of a dollar per capita spent for dentistry, which average when applied to the whole country gives the aggregate sum spent in the United States, as over \$52,000,000, which means \$2,400 to every practitioner. These figures may be optimistic in their results, but they are of sufficient accuracy to demonstrate that dentistry is one of the leading professions, as far as the average income goes.

In our study of this subject we have endeavored to argue from both sides, with fairness, and to this end I beg leave to present to you a picture of a professional dentist. He is all that the term implies, educated, courteous and self-respecting, and such an one attracts because of these accomplishments. They need no other advertisement for they are already in possession of the very best things, and their clientage will surely recognize this fact, not only by their valuable patronage, but will also speak words of encouragement to their afflicted friends, with a suggestion as to where they may be sure of good treatment.

Many phases in our profession to-day require our careful thought and best judgment because of their difficult solution. None more vexatious come to us than the one that pulls down. Just why this force is not applied to the uplift is to us one of the strange things in dentistry which we must get acquainted with and eradicate. How to reach out for this class and disabuse their minds of this hallucination may always remain a mystery, but it is certain that an effort should be made on this direction. A consciousness of inferiority and dire necessity has lead many undoubtedly to take this course. Were all to look back and not forward, progress would be of an uncertain tenure. To this class fees cannot be made too small in their estimation, for it is the real thing they

offer to induce a large patronage to themselves, hoping thereby to reap abundantly, forgetting the scriptural lesson, "as ye sow, so shall ye reap." If our professional conduct, both as to skill and scale of fees should reach a common level, inferior to the standard to which we are now endeavoring to maintain, it would result in a calamity for both layman and professional and would result in destroying all ambition for excellence. When our leaders have thus been deprived of the incentive to carry our banners to the hilltops, then surely will a retrograde movement set in and only end in the common place, bordering on the dismal swamp. Our pilots would then be advertisers and mud throwers.

Such a catastrophe can only be averted by strong individual effort united in society, a purpose high and broad in its aim to guard our weak points and strengthen our professional lines, to the end that justice may be done to practitioner and patient alike.

I trust that I have made dental ethics more clear in your mind and created some desire to get nearer each other for council and improvement. If so I shall feel happy in the thought that I have done something in the uplifting of a calling that has long since furnished me a decent livelihood and an honorable position in the community in which I have labored.

DENTAL ANATOMY IN ITS RELATION TO CROWN AND BRIDGE WORK.*

BY RAYMOND J. WENKER, D. D. S., WATERTOWN, WIS.

After having received the appointment by your president, a number of letters were written to specialists, in this and neighboring States, asking which they consider the more important in extending a band beneath the gingiva, in crowning, the border of the alveolar process, or the peridental membrane. Of those replying the majority consider the peridental membrane the more important, while a few believe that the alveolar process is fully, if not more, liable to encroachment.

On the whole, judging from statements made by practitioners, there appears to be a shadow of uncertainty as to the exact relative position of these tissues.

The gingival line is at the junction of the enamel and cementum. It is the dividing line between the crown and root, and

*Read before the Wisconsin State Dental Society.

marks the limit crownwise of the attachment of the peridental membrane. In its course it forms several marked curvatures. The average curvature on the mesial surface of the respective teeth, in fractions of an inch, is as follows :

Palmer	" .11	.11	.09	.04	.03	.08	.05	.02 "
Notation.	1	2	3	4	5	6	7	8
	1	2	3	4	5	6	7	8
	" .09	.09	.11	.03	.02	.04	.00	.00 "

The curvature on the distal surface is usually somewhat less.

The alveolar process normally envelopes the roots of the teeth to within a short distance of the gingival line, varying from one forty-eighth to six forty-eighths of an inch in the young adult. This distance increases somewhat with advancing age.

The borders of the process on the labio-buccal and lingual sides, normally presents a series of imperfect semicircles, nearly corresponding with the curvature of the gingival line of the several teeth. The borders of the septa, in the anterior part of the mouth, are arched, but this diminishes rapidly from the cuspids backward. Between the molars, it presents either a straight line, or a slight concavity, so that the highest points of the process are at the angles of these teeth.

The peridental membrane invests the roots of the teeth farther crownwise than the alveolar process, in normal condition investing them as far as the gingival line.

In the gingival portion, or that part of the membrane between the gingival line and the border of the alveolar process, the fibers pass out nearly at right angles with the long axis of the root. Those arising at, or near the gingival line, after passing out a little distance, are lost in the fibrous tissue of the gums. Farther rootwise, the fibers pass over the border of the alveolar process, and are continuous with the periosteum.

The line of attachment of the membrane, normally corresponds with the curvature of the gingival line, so that in this condition, the distance between the line of attachment and the border of the alveolar process, is from one forty-eighth to six forty-eighths of an inch, in the young adult.

But under certain conditions, the membrane may recede or become detached, thereby removing the line of attachment somewhat rootwise. After a careful consideration of these facts, it became evident that special measurements would be necessary to

determine this distance under the many varying conditions. Accordingly such measurements were taken from fresh cadavara, in the dissecting room of the Milwaukee Medical College and School of Dentistry. They indicate a variation of from one forty-eighth to three and one-half forty-eighths of an inch.

These examinations show that in the young adult with perfect formed teeth and healthy gingivæ, the distance is less than in subjects wherein these tissues are defective. In cases of advanced age where gingival cavities, or deposits of serumal calculus were present, the distance appeared greater than where these conditions were absent. They further show that the alveolar process cannot be encroached upon with a band, except by cutting through the gingival portion of the peridental membrane.

The gingivæ, or free margins of the gums, normally invest a narrow portion of the crowns of the teeth, from the gingival line crownwise. The width of the gingivæ, from the edge to the line of attachment, varies in the same mouth, and in different individuals. They are usually widest in youth, and diminish as age advances.

The gingival septa, situated between the crowns, are wider than the body. In normal conditions, they completely fill the interproximate spaces, from the gingival line to the point of proximate contact.

A number of measurements of the width of the gingivæ taken on the labial and buccal surfaces of the teeth, from patients in private practice, show a variation of from two forty-eighths to six forty-eighths of an inch, between the ages of ten and thirty.

The natural order of variation in the relative position of all the investing tissues is frequently modified by some mechanical cause. For example: a tooth requiring an artificial crown, usually has lost its contour in a sufficient degree, to allow food to pack in the interproximate spaces, thereby causing recession of the gingival septa, detachment of the peridental membrane, and resorption of the alveolar septa.

Where a bridge is required, recession has taken place next to the edentulous space, often to such a degree, as to expose the gingival line.

If the recession is due to a mechanical cause, and the tissues are not impaired, after its removal the gingival septa, at least, will return to their normal position. The question then arises: how far beneath the gingiva should a band be extended?

No matter what the age of the patient, or degree of recession of the investing tissues may be, extend the band beneath the gingiva sufficiently only to subserve the purpose of a band. Extend it an equal distance, at all points, beneath the edge of the gingiva, and a safe distance from the line of attachment of the peridental membrane.

Give nature a chance, where conditions are favorable, to reattach the membrane. Give her a chance to replace the gingiva, in its normal position.

The great fault lies in extending the band too far beneath the gum line; believing ample extension necessary to prevent ultimate exposure; losing sight of the fact that in so doing you are encroaching upon, and even detaching the peridental membrane.

The farther it is extended, the greater will be the difficulties encountered; the soft tissues will be lacerated, materially impaired, the tooth improperly shaped, and a poor fitting band the immediate result. However perfect nature may, in a few weeks, conceal this fallacious condition, the very perversion you have endeavored to prevent, will be the least that may follow, inflammation, recession and decay.

To obtain the best results, the gingiva should be temporarily dilated and receded before preparing the tooth to receive a band, and before setting a crown. This can be readily accomplished by twisting absorbent cotton on a waxed ligature, and tying it around the tooth against the gingiva the day before operating. The gingival border of the band should not only be in the proper relation to the line of attachment of the membrane, but it should also be dressed to a thin edge, and fit snugly to the tooth on all sides. When the surface of the tooth is to receive a band, cannot be made convex in a line parallel to the border of the gingiva, the band should be burnished to fit this concavity. But if the concavity is in the form of a deep fissure, it should be filled with gold or amalgam.

The following teeth are more or less difficult to band, by reason of their form at or near their cervices:

The upper lateral, when fissured on the lingual surface. The upper first bicuspid, when deeply concave on the mesial and distal surfaces.

The upper first molar, when grooved on the distal and lingual surfaces. The upper second molar, when deformed.

The lower first bicuspid, having an unusually constricted neck.

The lower first molar, being usually flat or concave on the mesial surface.

And, when considerable recession of the investing tissues has taken place, the molars are especially difficult to band.

Where the contour of a tooth has been lost for some time, or the points of proximate contact have been flattened by wear, the width of the interproximate spaces is not infrequently reduced, by nature's effort to maintain the contact of the teeth.

The normal width of the spaces must be restored to protect gingival septa from any unnatural pressure, and the proximate surfaces of the adjacent teeth from decay.

The average width is about one-tenth of an inch; the narrowest being between the incisors and cuspids; the widest between the molars, and the intermediate between the bicuspids.

But the normal size in a given case should be determined by ascertaining its width between similar teeth and the mesio distal diameter of a like tooth in the same mouth.

To place a crown with too great a mesio-distal diameter in a conspicuous position in the arch, would be going to the extreme. While this can be done in the posterior part of the arch, in special cases with good results.

The normal width of the space having been restored to maintain it, the artificial crown must contact firmly with the adjacent teeth and correspond with the typical form as nearly as circumstances will permit.

The points of contact, in the most perfect dentures, are near the occlusal surfaces. In the incisors and cuspids they are in line with the cutting edges, following the curve of the arch. In the bicuspids and molars they are nearly in line with the buccal cusps. The typical point of contact is at a single, smooth, round point, such as would be made by the contact of two spherical bodies. If the points of contact of the natural teeth are somewhat removed to the lingual, it may be advisable, and even necessary, to make the artificial crown contact accordingly. With this exception the typical contact should always be secured.

Having the artificial thus far constructed the next important step is the occlusion. The typical form is such as to make the best possible adaptation of the occlusal surfaces of the teeth; the ridges and cusps fitting into the sulci and fossæ of the opposing

teeth; each tooth occluding with two in the opposing jaw, except the lower central incisors and upper third molars.

The relative mesio-distal position of the respective teeth of the upper to those of the lower jaw in the typical occlusion is as follows :

Typical occlusion represented by the Palmer notation. Abbreviations used, M. mesial; D. distal.

- $\bar{1}$ occludes with $\bar{1}$ and M. $\frac{1}{3}$ to $\frac{1}{2}$ of $\bar{2}$.
- $\bar{2}$ occludes with D. $\frac{1}{2}$ to $\frac{2}{3}$ of $\bar{2}$, and M. $\frac{1}{3}$ of $\bar{3}$.
- $\bar{3}$ occludes with D. $\frac{2}{3}$ of $\bar{3}$, and M. $\frac{1}{2}$ of $\bar{4}$.
- $\bar{4}$ occludes with D. $\frac{1}{2}$ of $\bar{4}$, and M. $\frac{1}{2}$ of $\bar{5}$.
- $\bar{5}$ occludes with D. $\frac{1}{2}$ of $\bar{5}$, and M. $\frac{1}{3}$ of $\bar{6}$.
- $\bar{6}$ occludes with D. $\frac{2}{3}$ of $\bar{6}$, and M. $\frac{1}{3}$ of $\bar{7}$.
- $\bar{7}$ occludes with D. $\frac{2}{3}$ of $\bar{7}$, and M. $\frac{1}{3}$ of $\bar{8}$.
- $\bar{8}$ occludes with D. $\frac{2}{3}$ of $\bar{8}$.

In exceptional cases it may be necessary to give the artificial an abnormal occlusion, but in general no improvement can be made by deviating from the typical.

While considerable might be added, yet on the whole, if we will be guided in our daily practice by what has been given, fewer cases will be met wherein the imperfection of the artificial is manifested by the perversion of the natural.

PROCEEDINGS OF SOCIETIES.

WISCONSIN STATE DENTAL SOCIETY.

Twenty-sixth annual session of the Wisconsin State Dental Society, held at Madison, July, 1896.

On motion, after the transaction of miscellaneous business a paper by H. A. Palmer was read (see page 620).

DISCUSSION.

Dr. B. G. MAERCKLEIN, Milwaukee : The suggestions made in the paper are to the point. There are some things though that are difficult to reach. When we consider inflammation we have a complicated subject. Inflammation has been defined as possessing certain peculiar qualities and manifestations, which, however, are sometimes absent; and particularly so in pulp inflammation; perhaps not so much in the periodontal membrane as in the dentine itself. Sometimes almost all of the phenomena usually associated with

inflammation are absent, yet there is no question in my mind that inflammation exists there, even without heat, swelling or redness. Inflammation may be nothing more or less than malnutrition, from some cause; and it is generally admitted to be the result of an irritant. Nutrition is interfered with and we have either stoppage, complete cessation, or too much nutrient matter supplied to the part. Whenever a slight amount of irritation is occasioned we call it stimulation. Slight stimulation produces increased nutrition, and perhaps excessive health, if we can use that word. While if we carry that irritation too far, it produces stagnation, general retrogression, and finally death of the part. To get at all of the causes producing these various phenomena is perhaps as complicated a study as we are ever called upon to investigate. There is nothing more complicated than the matter of nutrition. The process of supply and waste is constantly going on in our bodies, unconsciously. Certain portions are removed and other portions are added to it at the same time; and when from any cause this regularity is interfered with, we have disorder. We generally have trouble in teeth, and especially in the peridental membrane, when there is some cause interfering with the normal condition of the pulp of the tooth. That is perhaps one of the most frequent causes that we are called upon to deal with. However there are other causes. There are for instance general constitutional causes which lie entirely beyond the reach of the dentist. Some of those have puzzled, and are still puzzling the minds of the ablest men of the present day. Pyorrhœa alveolaris is a condition of inflammation of the peridental membrane. Members of societies are divided upon the subject whether it is a local or a constitutional irritant that produces it. I heard only two years ago the positive statement on the floor of the American Dental Association that it was *always* an irritation from the outside, which produced this condition; and that it always could be controlled by proper cleanliness and care. This position was taken by some of the best men in that association. I have at the present time a patient under my observation, an isolated case where that theory is disproved. The patient had the pulp of a right upper cuspid destroyed, the pulp chamber filled, and the tooth filled with amalgam, in 1861. At that time the patient was in very good health. Since then he has gone through the war, and has seen a great many hard times; various changes of his life have occurred, and while the pulps of all of the other

teeth, or most of them, are alive, the disease that I refer to has entirely destroyed the alveoli and the gums, and most of the teeth are dropping out; while the single cuspid stands there to-day healthy, well and firm. I have shown it to a number of other dentists, notably my brothers, and we have watched the case for several years. There is no question in my mind that there is a constitutional vice of some kind in that man's body, and as long as the blood supply has remained normal, this vice has been carried to every particle of the body that the blood supply reaches. Depriving that tooth of its portion of the blood supply I believe has been the reason why it has not suffered to a like extent with the rest. There is possibly another explanation: That the amalgam in the tooth has possibly acted in some way to have destroyed those germs or bacilli, or whatever irritant it may be that has ruined all the other teeth.

Dr. S. A. NIELSON, Madison: I would like to ask Dr. Maercklein what the root canal of that tooth was filled with.

Dr. MAERCKLEIN: I could not say. I have never removed the amalgam filling from it. The amalgam filling is still good, but there is considerable discoloration. I might state, in addition, that I have given that matter considerable thought and study, and I am not positively clear in my own mind that it is the destruction of the blood supply that has preserved it; but as far as I have been able to learn, I would say that everything points that way. It is possible that the amalgam, or oxydization has had some effect upon preserving it; but it does not seem so. Others have been filled with amalgam that have been lost. The indications are that it is a constitutional vice that has carried the disease to all the other teeth excepting that single one.

Dr. L. J. STEPHEN, Milwaukee: In addition to the remarks of Dr. Maercklein with reference to his experience in this case, I would like to say that about two months ago I read an exhaustive report of some eastern dentist which enumerated some forty different cases of pyorrhœa alveolaris. He claimed an absolute cure by devitalizing the nerve and filling the root canal.

Dr. R. G. RICHTER, Milwaukee: I would like to ask what report the gentleman made, who claimed he cured pyorrhœa alveolaris in this way, and what his theory is.

Dr. STEPHEN: He claims that the disease proper is due to the nerve structure itself, and by devitalizing the same, and depriving

the tooth of its nutrition, he thereby cures the disease. Taken in connection with Dr. Maercklein's experience I have no doubt there may be something in it.

Dr. B. G. MAERCKLEIN : There were some other points in the paper that were certainly deserving of mention and discussion. The question of teaching persons how to take care of their teeth was one; and another question : that each child be obliged to present a certificate from some reputable dentist before being allowed to enter school. There are certainly various diseases communicated from child to child at school; and I do not doubt there are some diseases communicated by the interchange of chewing gum, pencils and pens. Most all school children are in the habit of putting articles in their mouth, and if somebody else who is not exactly healthy picks it up and puts it in his mouth he is likely to become diseased. That is a habit, which ought to be looked into, but before we can arrive possibly at that stage of development it would be necessary to change our entire educational system; not alone our common school educational system, but our system for educating dentists. The present system of colleges would in the first place be entirely inadequate ; and in the second place entirely out of place. Before we could arrive at anything of that kind, or require the inhabitants of a State to undergo such an examination, we ought to provide a place where they can be educated, in order to be qualified dentists, and properly qualified. It will finally have to come to it, that all colleges shall be departments of the University of the State in which they are located, and controlled by the State. The curriculum prescribed by officials of the State, and governed by the State. Then you can at least say that you are turning out well qualified men. The subject of remuneration, or the life of the college, need never enter into the minds of the professors. They need not care whether they have five students or 5,000, the study goes on just the same. Under this system you can be reasonably sure of turning out well qualified dentists ; and a certificate from one of these institutions would mean something. At the present time I do not think that any such dream as was referred to could be possibly carried into execution. It would be a very good thing for people generally, but difficult to establish; although I do not see why we have not the right to make laws that children's teeth should be taken care of just as we have a board of health that is looking after the general health of the commu-

nity in cities. They make laws of their own. They condemn things, and they forcibly destroy things, that menace the health generally. They close schools, and do most all kinds of things; and have the power and right to do it. I don't know but we ought to have the right to do likewise. I wish somebody else would take up some other part of this paper and discuss it. It is a very important subject.

Dr. C. C. CHITTENDEN, Madison: I was well pleased with Dr. Palmer's suggestion as to the many causes that produce peridental inflammation, when it is almost impossible to diagnose what is the matter. There are those little bits of things; particularly in the finishing of an operation, a filling on the occlusal surface of grinding teeth. If there is an excess of material so that the metal itself strikes too soon, it can readily occur that the patient leaves under those conditions. When the tooth has been under a long operation of filling, from one to two or three hours, it is almost impossible for the patient to decide whether the bite is free or not; and it is wise always, it seems to me, to have a positive understanding with the patient that if there is continued disturbance, if there is a continued soreness presenting itself, indicating the beginning of peridental inflammation, he should report at once, and have the cause removed. I think it is an easy matter to leave too much filling in the teeth.

Dr. W. H. CHILSON, Appleton: I am always interested in Dr. Palmer's papers. He furnishes papers with a good deal of thought and practical suggestion, but I came in too late to get the drift of the paper. I only heard the closing paragraph. The ideas advanced by Dr. Maercklein in the discussion have presented some new points. I did hear that part of the paper in regard to sanitation, and I think the ground is well taken. I do not know how far we have a right to interfere with public instruction, to the extent of having our theories accepted, but I do know that there is a great deal of mischief along that line. I have been connected as a school officer with our schools for a number of years, and I have studied that question as I went along. I found that physically weak children in school, invariably had some trouble with their dentures. There is irritation, and the younger ones, most all of them, are suffering with irritation, caused by carious teeth; they have many of them in their mouth at one time.

You know the condition better than I can relate it to you, because it comes under your observation almost daily. There isn't any doubt in my mind that children do have conditions of their mouth by which they can transmit disease to one another. It has been suggested by Dr. Maercklein how that is done. I agree with him fully, and will add that children, like older children, sometimes do kissing, and thereby wherever one has a diseased mouth, has a diseased condition in his lips, it is communicated to others. The State is already taking measures, in its educational system, to incorporate in the curriculum of the common schools the teaching of physiology and hygiene; and I think that if it is attended to when the legislation is formed on this subject, that it can be enlarged upon, and these very conditions which we know are most dangerous, which the child has in the school period, perhaps can be obviated almost entirely. I don't know how we could reach that unless we could reach it through a committee, who might visit the legislature during its session, and follow up any amendment that might come to the school law, and see that dentistry in its relation to health might be carried out in the public school system, as well as other branches.

Dr. W. C. WENDEL, Milwaukee: Did I understand Dr. Chilson correctly, that he had an idea that through osculation of children microbes or microörganisms were carried from one to the other, or did I misconstrue the remark?

Dr. CHILSON: I said I had an idea that disease could be communicated in that way.

President SOUTHWELL: With young children as well as grown children. Dr. Palmer will now close the discussion.

Dr. H. A. PALMER, Janesville: I am sorry you have not discussed this paper more. I hoped you would pick it all to pieces, so there wouldn't be much left for publication. I don't know whether to think it wasn't worth discussion, or whether to take it as a compliment. I will adopt the latter view. In the study of this question, one thing has impressed itself upon my mind, it has been suggested here by somebody, and that is the insignificance of the cause of peridental inflammation. There are so many of these little things; what we call little things, that amount to a great deal if they are followed out. I have not only found this in study, but from looking back over my practice. I remember one case that came to my mind during Dr. Chittenden's remarks. I did some

filling for a girl, and she shortly after left town. She went to the neighboring city of Stoughton, and my friend Pargerter, soon wrote to me that he had to grind off some of those fillings; I had been too generous; been giving the girl more than her money's worth; been filling them up too full. The consequence was periodontal inflammation. She happened to go to the right man that time. If she had gone to some other fellow, I would have heard from it unpleasantly.

Then another case came to my mind where, I forget whether Dr. Pargerter or myself put in an amalgam filling, and left a very minute particle of the amalgam under the gum. I had the pleasure a few days afterward of cutting that out, and treating it quite considerably, before we reduced the inflammation. So I say the thought has impressed upon my mind that we ought to look after these little things.

Now in regard to this educational matter: Those who have known me ever since I have been a member of the society, know that I am a kind of a crank on that subject. I believe if we could educate the rising generation in the line of dentistry, we would be doing not only a benefit to ourselves financially; but, morally speaking, we would be doing a great good. Although I do not like to disagree with the ideas of Dr. Maercklein, yet I like that dream that was published in the *Items of Interest* a while ago. I do not believe he comprehended the thought as suggested by the dream. Those who have read it call to mind that the writer placed himself forward fifty years, or was placed there by a gentleman appearing in his office who lived at that time, and did not know anything about vulcanizing; didn't know what he meant by asking him what he vulcanized a plate for; they didn't make plates. He wanted to know why, and was told that they had educated the children to that extent that there was no need of plates; they kept their teeth. He said at that time where he lived, there was a law that did not require the children to have their teeth fixed by the dentist, but it required each child before entering his class to present a card to the teacher, stating the exact condition of that child's teeth. It might have one cavity, and might not have any; it might have twenty of them. The idea was this: You send a child to a dentist, he looks over the teeth and marks down on a card that, "Robbie has five cavities in his teeth." He takes that home, as well as to his teacher. The parent says, "Why I thought his

teeth were all right; I didn't think Robbie had a single tooth that was unsound. He must have those teeth filled." And so Robbie not only is permitted to enter his class, because he has this card, but he goes to the dentist and he gets his teeth taken care of. I do not see that there is any objection to that kind of a law, or that anybody could find one single fault with it. Of course they would say "Oh you dentists are trying to fill your pockets." We have to meet that kind of an objection, gentlemen, every day for that matter. Of course we are trying to get something along the lines of gold, or silver, one or the other, possibly both; but at the same time let us teach the people that there is something higher and nobler in our minds than simply the gold or silver dollars, and that is the benefit to mankind. I claim that if my child has his teeth taken care of he is benefited; and I would like to see just that kind of a law passed. I would like to see it made compulsory that every child, not only in the cities, but in the country districts, is obliged to go to a dentist that knows something; and I think we have quite a number of men in this Senate Chamber this afternoon, that are capable of telling the child whether he has any bad teeth or not. I would like to see the children of Wisconsin compelled by law to go to some respectable dentist and have him examine the teeth, and then take a little card home showing just the state of those teeth. I think our practice would not only increase, but I think that in a very short time the habit would be formed of going to the dentist twice or three times a year or oftener, and that a great deal of pain and trouble which now ensues would be stopped. I would like to hear this question discussed a little more.

Dr. L. J. STEPHEN, Milwaukee: The education of the public in my mind seems one of the greatest and most important steps that we have to contend with. It appears to me that we cannot do enough toward this matter; and I have often wondered why it is that the State society has never done anything in that direction, to interest the publishers of text-books, or at least communicate directly with our school boards in that direction. I wrote a paper about two years ago on that subject, and I am sorry to say at the time it was not discussed. Unfortunately the paper was read just before the close of the session, and that was probably the cause. I think the proper way is to begin with the children. There is an old proverb which says "It is a hard thing to teach an old dog new

tricks," and the only way would be to begin at the public schools, and embody it in the text-books. I think this society should appoint a committee to communicate with the different school boards of the State. Possibly something might be done in that direction. I do not think we ought to go to sleep over it, because it is a matter of great importance. We might make a start. Possibly it will require a number of years before we can do anything; but we ought to do less talking and have more action. All this discussion will do no good whatever if we do not go to work. I for my part would be willing to do a great deal of work in that direction. I think we owe it to ourselves and to the welfare of the profession, as well as to the public. We often wonder why children are not brought up differently. Children are taught to comb their hair and wash their faces, but perhaps in nine cases out of ten they never brush their teeth. Why is it? It is simply due to the ignorance of the masses of the people. I think it is the province of this society to take hold of the matter.

Dr. PALMER: I want to say another word, which I had intended to say. Dr. Stephens' remarks have called it to my mind. I think that we as dentists could do a great deal along this line of education right in our public schools. Now there is not a teacher but what would be glad—if they are teachers worthy of the name—to welcome a dentist who would be willing to talk a little while to the children in regard to the care of their teeth. I do not believe it would be in violation of the code of ethics to do that. If it is, I have broken the code all to smash within the last year. The superintendent of the school for the blind very kindly asked me to go out there one night and talk with those boys and girls about taking care of their teeth. I did so. I don't know whether my brother dentists in Janesville knew it or not; it was not published in the papers, but the children got the benefit of what little I could tell them.

Dr. S. A. NIELSON, Madison: I think you will find it will be a difficult matter to force any compulsory law upon the people. I think it is a question of beginning in the right place. It is an easy matter to make intelligent people understand that their children should have their teeth examined, and they should have them examined often; but you know they tried to pass a law here not many years ago to have the children learn to read and write English. Now if they do not want to force them to learn to read and write,

it would be a difficult matter to force them into a dentist's office to have their teeth examined. If we began to educate dentists more, to elevate the profession higher, so there would not be so many quacks around on the corners extracting teeth for nothing, or around in the hotels advertising to do work for nothing, we would accomplish more, and the people would not feel like waiting until a certain one comes along and takes out their teeth for nothing. It is a wise plan to discuss the lifting up of the profession, and then try to do something in the way of having a law passed. The physicians of this State have tried for years to have a law passed, and an examining board, so as to prevent quacks from coming in; but they claim in the committee rooms that if a man is sick he has a right to call in whoever he pleases. It is his own body and he has the right to do with it as he pleases. I think before trying to have a law of that kind passed, or in fact taking any steps in that direction, that we should first get our profession above reproach.

Dr. E. B. OWEN, Brodhead: I have been very much interested in this discussion on the subject of public education, and also of the paper of Dr. Palmer. In regard to educating the public, the suggestions have been at the wrong end. Education should begin with the parents of the child, who have its control and management; then from the parents to the physician, who is supposed to be the guardian of the health of the public. Educate them properly, and the children will soon come under that education and receive the benefit of it. A humane thing would be for this dental society of the State of Wisconsin to issue a pamphlet in regard to the care of the deciduous and permanent teeth of the child, and of his mouth in general; issue it under the authority of the State Dental Society of Wisconsin, and let every dentist purchase copies at a nominal cost and distribute them among his patients and in the community in which he practices. That would be the proper way. You cannot compel a child to go to the dentist. You have a sort of compulsory education now. What does it amount to? It does not amount to the paper it is written or printed on. The little waifs are around the streets in every little town, and in the large towns in proportion, when they ought to be in school. This condition of things exists regardless of your law. Now to come down to where you compel them to go and have their teeth examined, that is going too far, at first. I have thought many times of a pamphlet of that kind to go out and be

distributed to the public. No matter if they are not your patients, if they are acquaintances and friends of yours. A dentist can afford to send them out. Some dentists have signed their names to a pamphlet of that kind, but that is a rather delicate thing for us who do not believe in advertising or publishing our names before the public. My experience has been with the parents of the child that it is difficult to educate them. When I went to practice at the town where I am now located, I doubt that there was a deciduous tooth filled in that town for fifteen years, or since Dr. Reynolds left the place. I had to preach and talk a long time before I could get patients to have the deciduous teeth filled. I have a good number of them now who come regularly to have their teeth looked after to the best of my ability. I had to talk to one mother for ten minutes to convince her that the sixth-year molar was not a temporary tooth, it was a permanent tooth.

On motion, the subject was passed.

The President, Dr. Southwell, then read his annual address (see page 615):

DISCUSSION.

Dr. H. A. PALMER, Janesville: I appreciate this address of the president very much. I like his suggestions. The thought occurred to me while he was talking about new laws and so on that next year our legislature meets here; and if anything is to be done a committee ought to be appointed at this session to see that it is carried out. That thought impressed itself upon my mind most; but I like the whole address, and especially that part of it that gave me such a hearty welcome back to earth again. I am glad to be here, but I won't tell you how I got back.

Dr. EDGAR PALMER, LaCrosse: With reference to this matter of permission, which the board is said to give, or be obliged to give, to those students who come home for their vacation, I wish to say that they have no more right to practice than as though they had not made their application. They are just as much liable, as far as my judgment goes, to prosecution, as though they had not made their application and paid their fee, providing any one sees fit to bring an action. No man has a right to practice or engage in the practice in the State unless he holds a license from the Board of Examiners. Until he holds that license he is liable to prosecution under the law. He has a right to make his application whenever he sees fit. His fee would entitle him to come up for

examination at the first meeting of the board ; but so far as his being exempt, or not liable to the penalties of the law, it is not a fact. He can be prosecuted at any time until he holds a license signed by the members of the board. The board have encouraged, so far as they could—and I think this will be borne out by the president and members of the board—young men to return to college and complete their education, rather than to come before the board for examination. But many of them have done so, I admit, and they have received probably as thorough an examination as they would receive in college. Those who have passed have been licensed to practice. But this is not a part of the president's suggestion which was that some extra legislation should be passed, to cover this point. Whatever it may be, of course, I as a member of the board would welcome it ; but so far as giving them any license or permission to practice dentistry, simply because they have made application, we do not do that.

Dr. B. G. MAERCKLEIN, Milwaukee: Referring to that same part of the paper, there seems to be two little things that are a matter of doubt in both the mind of the president and I think even Dr. Palmer. The president stated that there was a law authorizing the board to give a license to practice before examination, after the applicant had made application in due form and paid his fee for it. If my memory serves me correctly, being an ex-member of the board, I think the board once consulted the attorney-general on that subject, and it was the opinion of the attorney-general that it was not the law so far as the statutes were concerned, but the common law would always construe the doubt in favor of the applicant in case he was prosecuted after he had made due application. The supposition is that an applicant who sends in his fee and proper application to be examined, is ready to be examined. The board does not examine him ; and does not appoint any proper place for him to meet the board to be examined. In that way it would be an injustice to the applicant, no matter how well qualified he might be if he could not go on and practice. The attorney-general says the applicant, having performed his part so far as is in his power to do so, the fault lies with the board, and not with the applicant. No judge in the land would ever convict such an applicant, if he was brought up before a court. The doubt would always be construed in his favor, and the fault would be really with the board instead of the applicant. I don't believe it has ever

been carried into court, in fact, the board has always acted upon that while I was a member of it, and I believe it so acts now, but it is not a legal statute on the books, simply common law. On the other hand, that class of persons do very little, if any, injury when they are practicing the few months before they are examined. The great bulk of all the applicants that have ever come before the board have passed, consequently they have proved their ability to practice dentistry, or their qualifications at least. A few only have been rejected, that is, comparatively few ; consequently the amount of injury that has been done by that class of persons I do not think is worth taking into consideration, or adding any unnecessary amendment to our present law.

Dr. C. C. CHITTENDEN, Madison : I was out of the room, and was not aware of what the president has said on this subject; but Dr. Maercklein has explained it to me. The only way in which it would be possible to prevent any young man, after having made his application to the board for examination, from practicing his profession, would be to have the board in constant session; so that whenever a man wanted to practice he could appear before that board any day he might choose to make his application. That could be done, if we could find men of competence, who could be paid enough to make that the business of their life. If the claim is made that men are practicing in violation of the law in the State of Wisconsin, I positively deny it, on general principles. There isn't a State in the union that is so free from violation of the dental laws as the State of Wisconsin, or a State whose laws are so carefully and thoroughly obeyed in every detail. I am speaking from positive knowledge; not from what I have heard. I might say that there was a boy over here practicing dentistry that had not passed an examination. It is possible for anybody to state such a thing, but when it comes to bringing proof that men are violating the law and doing mischief, it is pretty difficult to prove. As soon as we find any such thing, it is certain that without reference to how much time it takes, our business will be left long enough to attend to that particular case and bring it to an issue. The board has done its duty. Provision would have to be made to have a board in constant session. This board gets no pay for what it is doing; and we think we are doing the work thoroughly. As far as violations are concerned, they are rare. We hear of a case, and when we come to sift it down, we find it is no violation

of the law. That occurred here, when a man came into this town two weeks ago, and I heard from him all over the State, that he was a violator of the law and had no license. When I came to investigate the matter he had a license, and was simply behind on the clause of registration. He had innocently and unwittingly failed to register last year, when he was not in the State. He was a fake; but the Board of Examiners is not the committee on ethics. The State Dental Society is the one to bring him up on the ethical questions.

Dr. W. C. WENDEL, Milwaukee: I want to congratulate our president on his able address. I wish to speak on the subject of harmony. What we want to dwell upon is the future, in regard to arranging meetings between other State societies; Iowa and Minnesota, I believe, was suggested. I think it a good idea; it would bring us into close communion with our brother dentists in adjoining States. It would be beneficial all around if it could be satisfactorily arranged, and I would like to see some advances made in that direction. Nothing would please me more. Still I would like to hear an expression on that matter. The State Board is able to take care of its affairs, as far as the law goes. It has the attorney-general to take care of it, and we had better talk of matters that pertain to our society. Certainly if our members do not take an interest in this, and discuss the matter, and work it up, we will never have an alliance or a joint session with the other societies. It would be a good idea to discuss it thoroughly.

Dr. S. A. NIELSON, Madison: Something occurred to me in listening to the able address of our president, about the Southern Wisconsin Dental Society. I received an invitation from it, and what I might say in reference to the society I do not say at all to find fault with it; but we have a State society here, and to form smaller societies within the State, does not that have a tendency to detract from the State society? I am only a new member in this society, but I noticed that when the roll was called the larger percentage of the members were not here. If they have smaller societies throughout the State, will not that have a tendency to make the attendance here still smaller? Would it not be a good plan to have these societies as branches of the State society, and have their members come into the State society? Then they might have their meetings in the northern, the eastern, the central, or the western parts of the State, and those dentists who could not come

to attend the State society might express their ideas there; and those who attended the smaller societies, some of them would come here, and we would get the benefit of the ideas of all the men of the profession throughout the State. I think that a plan of that kind would be helpful to the State society, and would increase the interest in it. Probably then, if the State society didn't meet each year, it might meet every two years, or meet so that we would have a larger attendance, and more of the dentists from throughout the State.

Dr. E. B. OWEN, Brodhead: That concerns me somewhat, as I am the principal mover in that Southern Wisconsin Dental Society. We did not organize that society with any view of withdrawing, or trying to draw from the interest manifested in the State society. We hope to get members into this society by giving them a taste of society meetings; educating them in society meetings, and thereby get them into the parent society at last. That was our object, together with the local benefit to ourselves. That is the purpose and the main object of the Southern Wisconsin Dental Society. We are all interested. You will see some of our members here before this session closes.

Dr. NIELSON: When I spoke I intended to say that I did not find any fault with the society, or make any insinuation upon its promoters. The only question with me is, should it not be under the control of the State society, so that we can control all the societies, and then come here and have a grand meeting of all the dentists in the State, at the State society meeting.

Dr. H. A. PALMER, Janesville: I do not see that it would make any difference, whether it is under the authority of this society, or something like a Baptist church, runs itself. As a proof of what I say I will refer to the society at Janesville as an illustration. There are six of us here, out of the membership of nine. Now if the organization of local societies has a tendency to keep members away from the State society, it operates differently with us, because we are here or going to be. We have our society meetings every month; and I am trying to train up these young boys that I have got with me, so that they are not only going to work at home, but you will hear from them before this society meeting is over. (Applause.)

Dr. C. C. CHITTENDEN, Madison: I am pleased to hear the reference made to the Southern Wisconsin Dental Society. I had the

pleasure of attending their meeting in May, and hoped to see many of the members from this society there (older members of the society), but failed to find them. The society was a direct outgrowth of the stir-up meeting held last year; many members joining from that section of the State. They went home desirous of keeping things alive, and soon after that meeting, in the fall, they established the Southern society. It was more of a sort of general familiar conference than anything else to me. It was a charming meeting, and was productive of much good. There had been different committees appointed in different sections of the State to try and get up district societies for local work, and more frequent gatherings than the State society affords; and this to me was a very delightful outcome of last year's State meeting. I think there will be present from the southwestern portion of the State almost every dentist before the sessions of this year are over; largely as a result of the enthusiasm aroused, and the interest it has created there. The dentists, notably of Platteville, Lancaster, Mineral Point and smaller towns about there, Monroe and Brodhead, were to have been there, but failed to show up. My friend, Dr. Owen, did not come, he was sick, and we were very sorry he was not there. There were half a dozen promised to go down from here, but nobody went but myself. One of the things that was accomplished there was the adoption of the American Dental Association's code of ethics, which governs us. It brought several men out of the newspapers, and into ethical relations. They said, "You have got to stop this," and they cheerfully accepted it. It established a minimum price list. It stopped the throat cutting business there. They adopted it conditionally, to be used experimentally for a year; and altogether the men met in their locality in a way that it would be very desirable to see in other portions of the State. I hope the same thing will obtain in the northwestern portion and the northeastern portion of our State. I think it might be possible to get the dentists in the city of Milwaukee together in some such way as that.

Dr. EDGAR PALMER, LaCrosse: I want to say a word in addition to what I did say in commendation of the address of the president. He has gone into the matter with painstaking care; and has given us many ideas upon which we should work. One reference that he made was to the young men who were coming into this society. As I looked around me to-day I was thinking

how few of the dentists before me there were, whose faces I am familiar with enough to call their names. I thought also of the year 1870, when we met in the other wing of this capital building. How many are here to-day who were here at that time? Only a few, a very few. There was at that time a committee appointed to escort into the room and introduce to the society, one of Wisconsin's most favored, most justly honored, and best representative men that we ever had. I recall that I was one of the committee that brought him in; and through all these years we have all known him but to honor and to love him. During the last two months he has been laid to his rest. I refer to Gen. Fairchild. Many scenes have transpired, and many events taken place since that time; and I can only congratulate the society upon having at this time a full membership and being in such prosperous condition. It has not been my pleasure to meet with you lately, having been out of the country during two meetings, and I have not taken a very active part in this society; but I think I have endeavored during these many years to do something toward the support of the interest in our society.

Dr. W. H. CHILSON, Appleton: That part of the address referring to branch societies in the State would meet with my approval fully. It is something we have considered in the past. But I think the Southern Wisconsin Dental Society is the first society born under that suggestion. They have certainly taken a step forward, and I hope the suggestion the president has offered in his address will be taken up and acted upon in other localities in the State. In the northeastern part of our State we learned of this society meeting after it had been held and adjourned. The schedule of minimum prices has been referred to, which was adopted by that society. A copy of them was sent to our society, and we felt so much pleased over that step that the dentists of our city met and adopted it with some few revisions. In no case did we lower any price, but we raised some of the prices that were placed upon that schedule, and adopted them under an agreement. We had that schedule printed and framed, and each one of the dentists in the city, with one exception, has a copy of that hanging in his office; in his two operating rooms, if he has them. If he has but one, one shall be in the operating room, and one in the reception room. We have tried a number of times up there to form

a society for the northeastern part of the State, but we would get along about so far, and then there would be objections, for instance to an agreement of this kind. I presume the Milwaukee dentists are quite familiar with that difficulty. I know they have tried many times to form societies there, but always failed. At our place we have agreed, about ten of us, that after the warm season is over we shall formulate ourselves into a society, ask for a charter, and go on in the name of the "Fox River Valley Dental Association;" I think it will be a stimulus, to bring into our society in that region many dentists. You would be surprised perhaps, unless you knew, that the city of Fond du Lac, Oshkosh, Neenah, Menasha, two of those named being large cities, have not a representative in this society. You may go on further, to the northeast, and there is Waupaca, Shawano, Clintonville, New London, Green Bay, Marinetto, Oconto, Wausau, Manitowoc and Sheboygan. They are all large prosperous places, and they all have a goodly number of dentists; yet I think there is not a representative from any one of those cities in the membership of our society. The strong objection which they make is traveling so great a distance, and the item of expense which that means. Were we to have more of these societies of a local nature I think it would not only be better for the profession of the State, but ultimately it would be much better for this society, because it would be a stimulus to go on to further association and effort; just as we here expressed to-day a desire to form a meeting with two other States. There is no doubt but that such a meeting as that would be a profitable one to those who entered it; but I am not prepared at this time to say a word for or against it.

Dr. G. C. MARLOWE, Bloomington: I want to say a word in regard to the Southern Wisconsin Dental Society, which was organized in Grant county a year ago last September. We met in September, a few of us, at Lancaster, for the purpose of organizing ourselves into a body known as the Southern Wisconsin Dental Society. We enjoyed the meeting very much, and gained some knowledge from gathering together and discussing the questions that came before that meeting. We arranged for our second meeting at Platteville, Wisconsin, last May. We met there at the time appointed; and found a goodly number present. Brother Chittenden here was with us, and took an active part; in fact was very instrumental in getting us started off nicely on these lines. The

schedule of prices was something that we accepted. We went in together on that matter, and all of us have found it advantageous indeed. I have the prices agreed upon framed and hanging in my operating room. The feeling there among dentists in that locality is much better and more agreeable than it has ever been before. I was invited here by Dr. Chittenden, we were all invited at that time, and I must say through the organization of that society I am here to-day. As a member of that society I want to thank Dr. Chittenden for what he did for us, by coming down and assisting in organizing our society.

Dr. CHITTENDEN: That society consisted largely of young graduates. There was scarcely a man there that had not taken his degree at a dental school. The character of the papers read there was something remarkable to me; they were good as well as the discussions. It was more of a family meeting, but I think the result will be that nearly every one of those men will be at this meeting.

President SOUTHWELL: If there is nothing further we will proceed to close. I want to say that in my paper I did not manifest any criticism toward the State board, in thought or expressed words; nor do I feel as though they are in any sense doing anything different from what they are obliged to do. I interviewed one young man who had made application to the board, sent his fee and is now practicing. I said to him, "Why, if you go to Madison and take the examination and you fail to pass, what are you going to do then?" "Why," he said, "I will go to some man, and have him back me up, and I will take him into partnership and run under his name. I will do the work under his name. I will not take my sign down; I will continue to practice." That was the point that I made. I think such men as that are unprincipled men. They are coming into the profession with wrong views.

So far as the law is concerned, if he fulfills his part of the agreement by sending in \$10, and makes his application, the law cannot touch him, because the law will uphold the man on account of his fulfilling his part of the contract. He makes his application, sends his fee, and if the board does not meet and examine him, why he can continue to practice until that board meets. I was very glad to have this discussion continued, as it was this afternoon, and yet there were some other points in the paper that I

would like to have had discussed. One was in relation to a committee being appointed to further the idea of a tri-State meeting, or inducing the American Dental Association to come West the coming year, or the next one. If there is some effort started on that line I presume that we can get it to meet at Minneapolis or some point near Wisconsin. We might then, close to that time, have a tri-State meeting and then go to the American Dental Association.

I was glad to note that the Wisconsin Southern Dental Society had sprung into existence. While I did not get an invitation, or did not attend, I should have been very much delighted to go. I should have been delighted also to hear the papers read by those young graduates. I do like to get among young boys that have some snap in them. I think it would be a good thing if the city of Milwaukee would organize a local society, even if we only had a half dozen members. Some of the younger men of the profession, and older men, and still older than that. If we could get them all together I think it would be of great benefit. In these large cities every one is suspicious and afraid the other fellow is cutting his throat all the time. I haven't used just the word I want to use, but he is very sensitive and jealous—that is the point I want to make—of the other fellow. I should be glad if that feeling could be entirely done away with.

Dr. H. A. PALMER, Janesville : I did not hear the suggestion on the question of local societies. We have had a little experience down at Janesville on this local line, and we found it very profitable. I think I should speak for the other bashful boys that are here. We not only found it profitable, but it has been a help to us ; I know it has been to me. One of the dentists said to me the other day that he thought we have the "whitest" lot of men in Janesville we had ever had. We do not look cross-eyed at each other when we meet on the street ; but we run into one another's offices and operating room, and act like men. I know it is a grand good thing. We all get together, except one man—and he is a kind of a back number, and we do not pay much attention to him—we have made a schedule of minimum prices. I think we all live up to it ; if we do not it is worse for the man who does not than the rest of us. More than that, here a few weeks ago we said we would have a half holiday every Saturday afternoon during this month and next ; so if you come down to Janesville on Saturday afternoon,

don't expect to find a dental office open. We are out in the woods, or somewhere; we get together and have a good time. I know the boys would bear me out in what I say.

The paper by W. H. Chilson was then read (see page 640):

DISCUSSION.

President SOUTHWELL: Gentlemen, the paper is before you. I wish to mention an incident to show how some advertisers work the "cheap racket." I know of a case of a dentist who advertised a crown for \$2.00. The patient goes there expecting the work all done and the crown put on. She pays her \$2.00, and the dentist says "Hold on; that crown is \$10.00." "Why, you advertised crowns for \$2.00." "Oh yes, I advertised crowns for \$2.00, but you must pay for the work. The work is \$8.00, and the crown is \$2.00.

Another case where a dentist advertised, "Sets of teeth \$5.00." The patient goes there to get a set of teeth and wants to know how much the set costs. The dentist says "\$15.00." "Why, you advertised teeth for \$5.00." "Why yes, I can give you a set of teeth, but you can't use them without a plate." "Do you charge for the plate?" "Yes." "How much do you charge for the plate?" "\$5.00 for the plate." "And do you charge for your work?" "Certainly, \$5.00." That is the way it goes. This advertisement is just to get them into the office; and that is all they want.

I will say still farther that I had in mind when I read the report of the committee, and heard Dr. Chilson's paper on Dental Ethics and Compensation, that there would be a great big hubbub; and here there has not a single one spoken yet, and it is three minutes since the paper was read. I expected the paper would stir up a discussion down here on dental ethics.

Dr. W. H. CHILSON, Appleton: If anybody has any objections to what has been said, I will be glad to hear them.

Dr. B. G. MAERCKLEIN, Milwaukee: I have been occupied by some little detail just now, and perhaps somebody else had better start this little stone rolling. I am glad to say that I am pleased with the paper of Dr. Chilson. He has brought out some ideas pertaining to the question of ethics. Ethics have been the stumbling block of this society ever since I have belonged to it; and yet, as he says in his paper, it is so easy to live up to them, if you

desire to do right, if you desire to be honest with your patients, and honest with yourself. The great trouble with those who have trouble with the ethics of this society is that they are trying to do something, or to make other people believe something, which is not true. It is just as the president has stated, that they pretend to give something, advertise it, have the patients come to the office, and when they have them in the office they think they can handle them and control them and get their money out of them. Now that is deceit; it is dishonesty, and nothing short of it. Why that class of people are so short-sighted as to follow such a course, has always been beyond my comprehension. A gentleman told me lately that if he had to go his course over again in life he never would put a single advertisement in a paper. It has been the mistake of his life; and should he stop now he would simply stop his practice; he would simply have to starve, because the better class of people have learned to look at him as a quack, as an advertising quack, and they will shun him. You could not get them into his office if you paid them for it. He has a number of times tried to stop it, but just as soon as he stopped advertising he had nothing to do; he has to catch new individuals, unsuspecting individuals, and make them again his victims; the old ones generally drop out.

Now the great object, as I understand, of advertising, is to get a practice, and to get something to do. If these gentlemen look into the future they could get practice in another way, without advertising. The question is simply a matter of honesty with yourself and with your patient. Be skillful. As the doctor has inferred in his paper, if you are not successful, if you are not up to the standard, do not pretend to be what you are not. Say "This is beyond my realm; I can do this for you, and no more." Get a reasonable pay for the services rendered, because they are honest services rendered, and you will have no trouble to get along. Gradually as you increase in your knowledge and in your skill you can demand better pay and get it. I think I can say with the majority of them that I have pretty well come up from the bottom of the ladder; and I can remember in my early practice when I used to go out into three little country villages where I had a very respectable sized practice established. I worked for reasonable prices, and did the best I could in every instance. I remember the last time that I went. I was gone for two weeks, and vis-

ited these three little villages. In that two weeks time I did \$500 worth of work, lacking a few dollars. It would have been sufficient to keep a man alive right in one of those little villages. I have seen the time that I could have lived in what I call affluence in that little village on \$500 an entire year. It is true I had an assistant helping me do some of the work, but it simply shows you the willingness of the people to pay a reasonable price for reasonable services. Afterward I quit going there. Others had heard of the great success I had had in these little places, and they flocked in like wild pigeons, one after the other. There was a dentist in the place almost every week, and sometimes there were two there at the same time. Instead of doing good honest work for honest fees they began to fool the people. They did poor work and tried to get big pay for it. They pretended that certain things were what they were not. The result was that after a few months' trial they came there and could not make their expenses; could not pay the landlord. It absolutely ruined the practice that had been established. Now the people were not any different, the country had not changed any and the places had not changed any. It was simply a different class of dentists that came there, and the different methods they pursued, that ruined that business. I or any other good man could go out in those very same places again, and in a few years by doing good, honest, diligent work reestablish that practice.

There seems to be in the minds of dentists generally an idea that there is not enough dentistry to be done to keep them busy; and unless they advertise and attract a great deal of attention there won't be enough work to go around. If ever a mistaken idea entered their heads that is one of them. If all the dentists in the United States at the present time were set at work cleaning the teeth of the American people, they could be kept busy and not half get through at the end of a year, doing nothing else but cleaning teeth. If some one was set to cleaning teeth at fifty cents, as they advertise, they could make a fair day's wages, if they were kept busy. There is not a family in the land that has not some dentistry that ought to be done. You can only get it by doing good, honest work for a fair remuneration. You cannot expect a man to pay you \$25 or \$50 for a gold filling that is working for a dollar a day; but he will pay you a dollar for an amalgam filling, if you do a good piece of work, and you can afford to do it, and you are not

losing any money or any time on that. You are giving him good service, if you do your work well, for the amount he pays for it. That is the trouble ; and if dentists would simply take that view of it, that there is more work in the world than all the dentists possibly can finish, they would have no need of advertising. Poor work has never been any good to dentistry. It has only been degrading dentistry, and dragging it down, and getting people disgusted with it. In the last two weeks I have received at least a dozen different patients from as many different dentists in the city of Milwaukee, all of them with an ulcerated tooth that had been filled, and the dentists did not know enough to recognize pericementitis, which has been discussed here this morning. They allowed it to go until an abscess was formed and the patient had to come to me. That is an injury to dentistry. I expressed to one individual the opinion that I was sorry to get that patient. I am sorry, because the work that has been done is an injury to dentistry, and no credit to the profession. It will keep many people from going to that dentist, that ought to have their teeth attended to. If the work had been good, the patient would have recommended it, and would have induced others of his acquaintance to go there. The great majority of our patients cannot afford to pay high prices ; but they can pay a reasonable price, and there are any number of persons who are willing to work for reasonable prices, as is evidenced by the advertisements in the paper.

Then there is the question of ethics as between one another. The same reason is at the bottom of it. If we were honest with ourselves, and honest with our brother practitioners, it would be an easy matter to get along. If I see a piece of work that is good for nothing, there is no reason in the world why I should not say that the filling is defective, and must be refilled if the patient wants to save it regardless of who did it ; I may have done it myself. It is defective, and it must be done over. I am doing no one an injury by saying so ; and I am doing the profession of dentistry a benefit.

There is no need of finding any particular fault with any individual. We are not all built upon the same basis, upon the same plan, or upon the same methods. Some have one way and some another ; yet they may be all right in a general way ; and we can overlook some of these little peculiarities. Unless we overlook them we will never be able to get along. If we are to resent every

little slight, every little unintentional wrong that may have been done us, we will always be fighting. We can overlook those things, be friendly to one another, and the more we are so I think the higher we will rise in the estimation of the public. It has been an old saying that when doctors disagree who shall decide? When dentists are fighting, how can you expect harmony among the people? One says one thing is good, and another says another. One man says gold filling is the only thing to permanently preserve the teeth; another says amalgam, and condemns the gold man, and says it is simply a plan of his to extract a few dollars from the people. There is where the trouble comes in. I have known dentists to put a little advertisement in the paper, just put it in such a way that it barely laps a little over the lines as outlined by the code; just enough to get some mention somewhere; to draw some attention of the people that a certain dentist has gone here or there or is doing this and that kind of thing. They are lying awake nights studying them up, and what for? Simply because they are afraid they won't have enough work to do. I don't know how it is with others, but I always had enough to do from the beginning of my practice to the present time. One trouble is, I have a streak of laziness, and am too lazy to work now and then. There is plenty of work, if the people will take hold of it; plenty left undone, if they will go out into the field and hunt it up, and work it up, as it ought to be seen to.

After the transaction of further miscellaneous business, the paper by S. A. Nielson was read (see page 633):

Dr. REINHOLD MAERCKLEIN, Milwaukee: Speaking about number five here (referring to drawing illustrating the paper), having the bucco-lingual fissure larger on the lingual than on the buccal surface, I should not advocate that unless there was decay. I think there is very little danger in that tooth splitting, with the amount of decay as represented there. If those fissures were in line with it, I do not think I would enlarge them, even if they were larger on the lingual than on the buccal surface. If the decay has extended further than that shown, I should cut the corners, clipping it right down. In other words, I should take out that right in through there (indicating on sketch). You would be obliged to, if decay had extended further, as is represented on this model, because certainly the lining of the dentine being removed, the enamel naturally would be frail. By simply cutting it down we

do away with the frail edges. I would pay little attention to whether the fissure is wider here than here (indicating), so as to bind the two together. I have never seen in my practice a molar of that kind splitting. Certainly if the decay has undermined any of these cusps it is necessary to cut down and clip down the cusps, and build up with filling, so as to make it strong.

Dr. S. A. NIELSON, Madison : In the teeth which I have marked here, there is no decay at all. Those are simply the fissures. I believe that all fissures perceptible to the naked eye should be drilled out; especially if the cusps are very prominent. I believe that the fissures as shown by all the teeth I have examined, and I have split up quite a number, extends to the dentine, and where the cusps are prominent the fissures are more prominent. I have had, just lately, from students coming here from out of the city, four teeth in the last six months, lower molars, that have split in two; both lingual cusps just hanging by the gum margins. The fissures had been simply drilled out, without any attention being paid to the holding together of the teeth. Now if this part is cut across there (indicating on drawing), you do not get this anchorage here so well as you would by cutting it this way. That is the point I wish to bring out.

Dr. REINHOLD MAERCKLEIN : I was speaking before about proximal cavities, in having the cusps built up. If the cavity is in a lower molar, and we do not cut out so as to make a weak point at the cusps, I see nothing to prevent holding the cusps, even if they are larger. A cusp is apt to give way, if there is a crown cavity, just as well this way as the other. Certainly it depends a great deal on the proportional size of the cavity. If too much is cut out, that is, if we cut away all the dentine, there is nothing to hold the cusp to the enamel, and it will break. I think in the majority of cases there is too much of an undermining, weakening the cusp.

Dr. B. G. MAERCKLEIN : I have been in the practice of dentistry for some time, but I have never seen a lower molar broken away like that, where the cavity had only been a fissure in the beginning and properly filled. I hardly think it is possible. It might be possible with an accident or force applied; blows or anything of that kind; but I hardly think it is possible to break a tooth by the process of mastication. The forces of mastication come more on the outer or buccal cusps than upon the lingual cusps, unless

the operator has been careless in the preparation of the fissure, and has entirely undermined the cusps. That by the way, is a frequent mistake; and I am sorry to say that I see it often. There is one thing that few dentists take into consideration; or at least, many seem to overlook. When operating on a lower molar, where instead of reaching it from the crown directly, one is operating at an angle, the lower molar is naturally inclined inward; that is its position in the jaw. When operating over the angle of the mouth, we do so from the outside in this way (illustrating), and often work at an angle of forty-five degrees. With the present drills and various appliances that we have it is easy to cut away too much substance. I have repeatedly seen teeth almost drilled through to the margin of the gum, in order to anchor the filling. The tooth standing in one direction and the drill pressing into it in the other, one is liable to come out at the margin of the gum. A tooth that has been so destroyed by the operator is likely to fail, and in fact it almost invariably fails, because the enamel has been deprived of its natural support, the dentine. I have seen that many times, but have never seen a tooth that was taken as early in the history of its decay as this is indicated, where there was simply a small decay in the fissure where it was possible to split it.

Another thing: The great majority of practitioners cut too deep and undercut the retaining points to hold the filling. They are always afraid the filling is going to tumble out. They are thinking, "Well, I have had a failure, and I will cut this a little deeper." By the time they are through with it, and have prepared the cavity to their own satisfaction, it is in what we in our parlance in the office have called, an egg-shell. They have undermined all sides, and have simply left a thin shell of enamel, that is as frail as can be to support the filling. The result is when the filling is inserted, in a very short time the margins of the enamel break down and out comes the filling, just what the operator tried to avoid.

I have mentioned it before this society a good many years ago, that it is possible to put in a filling of that kind—and I have volunteered to put it in—where the margins, the lateral surfaces of the cavity, are made exactly parallel, without any undercut whatever. Any crown cavity in any molar, upper or lower, can be filled, and can be permanently retained if it is properly filled, when the lateral surfaces of the cavity are exactly parallel. If a gold

filling is properly inserted and well put in, it is impossible to remove it, even with instruments, say nothing about the force of mastication. I have tried it. It can be done. It is held in there just exactly as a nail is held in the wood, when you drive it into the wall, or a piece of timber. The nail has no undercut, and yet you cannot remove it. The ordinary nail is even tapering the reverse way; yet if driven it holds. Just so will the gold hold with such a surface. Bicuspid with approximal cavities, and fissures in the crowns, are a class of teeth that operators very often ruin. They are so afraid that the filling is going to come out of the lateral surfaces that they undermine it on both sides in order to get sufficient retaining points. The result is they insert a very poor filling for fear of breaking the frail margins of the enamel. They cannot anchor it properly, and if any force or strain is brought upon it the enamel breaks away, and the whole filling comes with it. If they cut down, as the writer has indicated, those frail margins far enough so as to get the margin of the filling outside of the approximal surface, so that the ordinary toothbrush will reach it—bring it out far enough, and then make a very slight undercut, just enough to hold it on this surface, and put in a good filling carefully and solidly, you can use any force or strain that is likely to be brought upon it by any process of mastication, without any danger of dislodging the filling. I dare say that such a filling as a rule is stronger than the tooth itself.

Dr. C. C. CHITTENDEN: I would like to say one word in addition to what Dr. Maercklein has said in reference to square walls. He did not quite finish what he meant to say about filling and retaining with perfectly parallel walls. He meant to say it would be retained there, providing the proportion of depth was adequate for the width and other dimensions of the cavity.

Dr. B. G. MAERCKLEIN: Yes; in speaking of that before, I meant to say that if the depth of the cavity was the same as the width the filling would always be retained. If we make it a thirty-second of an inch wide it need only be a thirty-second of an inch deep, while if it is an eighth of an inch wide it ought to be an eighth of an inch deep, or nearly that. If a very shallow cavity, it is difficult to retain it with absolutely parallel walls. If shallow, and very wide, it ought to have a slight undercut, but slight only.

Dr. W. H. CHILSON: I would like to ask Dr. Maercklein if he

aims as a rule to make his cervical wall finish below the free margin of the gum on the proximal surface? In going to a depth where we make a large filling there may still be sound structure of dentine between the cervical wall and the margin of the gum. Is it desirable under those circumstances to cut down into the sound material so that the cavity when finished will finish below the margin of the gum, providing we do not go to a depth where we go through the dentine to the enamel?

Dr. B. G. MAERCKLEIN: Yes, in the majority of cases I do, and in the majority of cases I find that it is necessary. You will find on careful examination that the majority of proximal cavities start just above, and sometimes a little below, the free margin of the gum on the proximal surface. By the time you get the gum depressed and examine the enamel, you will find more or less disintegration having taken place close to the neck of the tooth; and by the time you have removed all of the disintegration, the enamel wall will have become so thin it is hardly worth leaving. It is frail, at the least, even if supported by sound dentine, and it is the better practice to cut it away until you get below the margin of the gum, or right up to it, not encroaching upon the periosteum of the neck of the tooth, however. You then begin to fill it up from that portion. It improves the form and shape of the tooth if you remove that portion of it, and restore it carefully with gold.

Some years ago when Dr. Marshall Webb advocated that theory it was very much opposed. I think he was the first one to call attention to that practice. I experimentally filled quite a number of teeth where I thought it was not necessary to cut down to the margin of the gum, and in the course of time I had to refill almost all of those on account of secondary decay taking place above the fillings. I have now for years made it a practice to cut down to that point. I almost invariably cut the lateral surfaces to bring them out wide enough so as to bring the free margin, at the line of the filling and enamel, outside of the proximal surfaces, so that the toothbrush can reach it. Then the shape and form of the tooth is such that it will only touch at the point of the occluding or grinding surface. I leave a V-shaped opening toward the neck of the tooth, a double V-shaped toward the lingual as well as the buccal surface, on account of the rounding. If the fillings are well made you have very little trouble with secondary decay.

In connection with fissures I may state that I have made it a

practice for years, to always cut out a fissure if it comes in contact with a proximal cavity. If the bicuspid or molar is decayed on the proximal surface, and this cavity extends into the fissure of the tooth or sulcus, no matter how sound that may appear, I take a bur or drill and cut it out and fill it the entire length of the fissure in all its details or bifurcations; because where the fissure makes a large depression we bring the filling in there and we cannot finish or fill that corner right where that fissure comes down, satisfactorily, and make it water tight, or prevent recurrence of decay. There is naturally a weak spot in the tooth, and unless we round that off, so that acids cannot generate there, we will have decay directly opposite the filling at the margin of the fissure. I have cut them out for years, whether they appear sound or not, and filled them up. Then I can round them off with a properly shaped bur and have a smooth surface, with a reasonable assurance that that tooth is well filled.

There is one more point I have not mentioned that regards the preparing of the margins of the enamel in line with the cleavage of the enamel prisms. I read a paper upon that subject before this society some twelve or fifteen years ago. At that time the question was somewhat new, and I was looked upon as rather extreme in my views. At the present time I am glad to say that almost all of the better men in the profession are following that practice. I look upon the enamel prism as a covering to the tooth, the same as I look upon a wooden blocked pavement as a covering to a street. The ends of the prisms are exposed, just exactly as the fiber of the wood is exposed to the surface; and they will withstand the most wear and tear from that surface. If you take out a single block of wood in a street pavement you will pretty soon have a large open space there where the blocks have all tumbled to pieces and gone to ruin. If you should approach the wood from the side instead of from the end you would find it would wear out very easily. If that was not the case we could use planks instead of blocks on end. A similarity exists with the enamel prism. You will find it is very difficult to take a bur and cut into sound enamel from the side of the teeth; but you can take any good, sharp bur and cut away the enamel after you have once exposed the sides of the prism. Now, you must protect the sides of those prisms with a filling if they have once become exposed, because it is there where they are weak and vulnerable.

On the other hand, if the prisms run in a certain line and you cut them off—the same as I would cut across my fingers in this way—you will have very small, short, wedge-shaped prisms at the outer margin of the filling; and they would never hold, I do not care how carefully the filling was inserted. While, if you cut them away in the line of the cleavage you will have the entire length of the prism, allowing it to be supported even by dentine below, and by placing the gold along side of that you run no risk of cracking or splitting them off. The operator can easily, by studying the various diverging positions of the enamel on the various positions of the teeth, ascertain for himself about how much he ought to cut away; and unless that is done we will almost always have failure.

Speaking about rounding the margins, it has been remarked by the essayist that flat disks should not be used. I believe that a little rounding of the finish of the margins of the enamel prisms is one of the most beneficial things we can possibly do, advocates to the contrary at the present time notwithstanding. They always tell us we must use sharp enamel chisels, and make that edge absolutely square. It is very difficult to make an absolutely square margin of enamel without injuring or fracturing more or less of it with a sharp chisel. By rounding off the margin a mere trifle, we remove any of the splintered and injured particles of the enamel, and by bringing the gold over that margin it is not so thin at the knife edge that it will ever turn up or bend away from it. I have put in fillings of that kind that have stood the wear and tear of fifteen or twenty years and the margin still remained true and perfect; so I know by experience they will stand. You make a more perfect protection for the margin of that prism by allowing the gold to run over it a trifle, and finishing flush with the margin of the enamel, than if you brought it up flat against it. If you bring it up flat against it you may have already disintegrated particles of enamel the moment you leave the filling finished.

Dr. C. C. CHITTENDEN: We have a gentleman with us here to-day who has never been at the meetings of our society, from the fact that he has been absent from the State since long before this society was organized. I have been talking with him here upon this very subject under discussion. That is Dr. S. V. Burnham, who practiced in Milwaukee in the 50's, afterward in Madison in the early 60's, and for the last thirty odd years at Cleveland, Ohio.

He is not a boy, by any means ; he is a man of fifty years' experience, and he has been through the mill. He is one of the oldest and best operators. I would like to hear from him on the subject of the enamel margin.

Dr. S. V. BURNHAM, Cleveland, Ohio : I have been much interested in what has been said about sharp margins of cavities. I do not think there is any such thing as what we might call a chisel edge of a cavity. It cannot be done. I have tried to cut such cavities in artificial teeth. I know we cannot do it without splitting off little edges, which is a dangerous affair. I do not like this notion about cutting down toward the margin of the enamel. We are apt to break through. Even after the filling is in it will break through, and, of course, such things as that must necessarily fail.

It seems pleasant to see so many gentlemen from Wisconsin. I came here in 1850. Some of the old dentists I know are still here, and the children of some of the rest of them. I feel, as I stand before you, like an old tree of the forest after all the rest of the trees have been cut down. I am glad to see you prospering in Wisconsin, and doing so much in dentistry. There are some men here whom I have not seen, but whose papers I have read for many years. I am glad to meet you to-day, and am glad to be welcomed by you. I have borne the heat and burden of the day, and am about done with it. (Applause.)

Dr. C. C. CHITTENDEN : I rise to a question of privilege. It is rarely that we have so distinguished a visitor in our society. Dr. Burnham has retired from practice on account of advancing years. He has done many things for the benefit of the dental profession. I move you, sir, that by a rising vote we declare him an honorary member of this society.

Dr. Burnham was elected by a rising vote.

Dr. S. A. NIELSON : I have nothing more I wish to say except that I still believe that the enamel margins should not be rounded. I know that I have seen a great many gold fillings put in where the enamel margins have been rounded, and you cannot tell the direct point of contact, or where the filling joins on to the enamel. If there is a distinct bevel there you know right where it is ; and when you have finished down to it you have a perfect outline to your filling. If you round them off you do not know where that outline is, and it is never left so smooth and nice as when they are beveled.

Dr. Joseph W. Boisol, Black River Falls, hereupon read a paper on the subject of "Systemic Medication in Dental Practice" (see page 636).

DISCUSSION.

Dr. R. Y. RICHTER, Milwaukee : I have listened to this paper with a great deal of interest. It is an able paper, and I think it advocates a step in the right direction. This is the first time, I think, that we ever had a paper on this subject before our society. It is a practice that I have been following a great deal, calling systemic medication to my aid in a great many cases.

Dr. JAMES T. STEWART, Milwaukee : This is one of the most timely subjects that we could possibly discuss and a step certainly in the right direction ; something that we ought to follow out, and something we ought all, individually, to pay a great deal of attention to; a subject comparatively new and valuable. I enjoyed the reading of the paper, and I for one will promise to try and profit by the suggestions. Certainly the remedies are simple, and the ideas were terse and well expressed.

Dr. B. G. MAERCKLEIN : In one portion of his paper the essayist spoke of lancing the gums for irritation in teething, or scarifying the gums. I do not believe in scarifying the gums. I do not think it does any good. If it is necessary to use the lancet it is necessary to cut down to the growing tooth ; to entirely cut the gum overlying the tooth. If in a single-rooted or pointed tooth one longitudinal incision is sufficient. If a molar which has four cusps to it, it is necessary to make a cross incision. This incision should run diagonally from cusp to cusp; say from the anterior buccal to the posterior lingual cusp, and from the anterior lingual to the posterior buccal cusp, not simply a crucial incision over the gum, but one that will entirely liberate all the cusps. The trouble caused by the growing tooth is not in the gums overlying the tooth, but it is in the sac in which the tooth is enveloped. The spasmodic contractions of the sac forcing the tooth forward are greater than the absorptions of the gums in a given case, and the pressure becomes too great on the sensitive pulp at the apex of the developing tooth. That may produce convulsions at any time, but the pressure on the gums could not alone, in themselves, produce convulsions, because the nerves are not sufficiently sensitive or irritative to produce this condition. Therefore, if lancing is necessary, cut down to the growing tooth and

liberate it, but do not scarify the gum. You would have simply pretended to do something for the patient, but would accomplish nothing.

One other point in the essay is the mixing of the medicines. They were read off very hurriedly, and it was difficult for me to keep track of them all, but in one paragraph I understood him to recommend as indicated by a certain condition belladonna, hyoscyamus and strychnia. He names also pulsatilla and others that I could not catch as he went on. I cannot possibly see how all of these remedies are indicated at the same time; because a number of those are nerve depressors or sedatives, while strychnia, above all, is the greatest nerve stimulant. It certainly does not belong in that class and ought to have been eliminated.

Dr. J. W. BOISOL, Black River Falls: I would like to reply to Dr. Maercklein, and state that I tried to put particular stress upon the fact that the symptoms of the medicine must be considered. In the homœopathic materia medica you look at a remedy; the symptoms which that remedy would cause or produce in a state of health are given. Then the homœopathic principle is, when those symptoms are present in a state of disease, or a pathological condition, that remedy is then indicated. The remedy which would produce the trouble in health is indicated when that pathological condition exists.

Dr. B. G. MAERCKLEIN: That is correct. I understood it in that way. But what I cannot understand is how the symptoms could point to belladonna being indicated as a nerve sedative, and at the same time strychnia as a nerve stimulant. That is the point I tried to make clear. I think that the remedies were named under the same indications; and I would wish to have those separated, because we know that strychnia causes convulsions. Now from the homœopathic standpoint strychnia may be indicated when a child is threatened with convulsions. According to my idea it would be the same as when a house was on fire and you see a pretty good place and you pour oil on it to put it out. But that is not the question we are discussing. That is the homœopathic method. If oil is indicated I cannot see how water would be indicated at the same time, and expect the same results. If oil is a good thing to pour on the house when it is afire, water is certainly not, because we know that water puts it out.

Dr. BOISOL: I will try and make that clear to Dr. Maercklein,

that an apparently identical trouble may exist, but the symptoms are entirely different; the patient's action may entirely differ; the general symptoms are not alike in the two cases, therefore a very opposite remedy may be indicated.

Dr. MAERCKLEIN: I believe I stand corrected to a certain degree. As I understood the paper when it was read, it was the same case where these various remedies were recommended. If the doctor takes two different cases, two different subjects, with two different symptoms, and suffering in a different manner, one might require a sedative and the other a stimulant. That would be perfectly proper; but as I understood it, these remedies were read off as being recommended for such a case, and they are all included under one head. If that is not the case I stand corrected.

Dr. BOISOL: I probably did not make it quite clear, but I did not mean one particular case. I meant a generality of cases.

President SOUTHWELL: I enjoyed the reading of this paper very much, and am glad to know that it will go into the hands of every dentist who is a member of this society, in pamphlet form. That is one of the later benefits that come to us, the reading of our proceedings and discussions when published in book form. Heretofore at our meetings we came and listened to papers and discussions, and everything was lost. The papers were filed away with the secretary and we heard nothing more from them. Now they are published in our proceedings and we can read them at our leisure, and profit by all the discussions that follow. I believe that the medicines which were recommended are coming to the front, and that we will all adopt some form of systemic medication. He spoke particularly of the extraction of teeth in cases of women in delicate condition. In my own practice I never refuse to extract a tooth, no matter in what stage the patient may be. If she is willing, and desires the tooth out, I will extract it at any time, but will never extract it by force or compulsion from any other person. I have had no bad results from this practice.

I trust this discussion will continue, for it is a very important subject. I would like to hear what other practitioners do in just that particular case. Of course we all know that there are times when we can open a pulpless tooth, and relieve the patient from suffering. We know we can apply arsenious acid and destroy the pulp, relieving the patient for a time, and continue the treatment on later; but when the tooth is inflamed and sore, and the patient

desires the tooth out immediately, I would like to know what the rest of the practitioners do in such cases.

Dr. REINHOLD MAERCKLEIN, Milwaukee: I recall one case where a lady came to me in a delicate condition, and it was the wisdom teeth that were troubling her. It was absolutely necessary to extract them, and she was perfectly willing to have it done. She came with the intention of having them out. I did remove them, and it did produce abortion in that case. It was the only thing I could do with them. They were in such condition that I had to remove them. They were impinging on the other teeth. They were difficult to remove, and it produced bad results. I have extracted teeth a great many times from patients in that condition, and I do not hesitate to extract them. I extract them always when there is nothing else to be done with them. I have never seen any bad results except in that one case. If the patient is willing to have them out, and you cannot do anything else with them, I do not hesitate, but remove them.

Dr. CHILSON: How long had this patient been suffering?

Dr. MAERCKLEIN: The first case?

Dr. CHILSON: Yes, sir.

Dr. MAERCKLEIN: That I do not know; I did not inquire; but she had been suffering quite a while. As I say, I have never had any bad results from any other case but this one. That was probably an exceptional case. In the first case it was the removal of two lower wisdom teeth. It was a case in which the teeth were difficult to remove, and produced a great strain upon the patient. Outside of that, it occurs very frequently that ladies come to us in a delicate condition where even their family physician has advised them to have treatment of the teeth, or temporary fillings put in. The question is asked of me often, whether they can have it done or not. I advise them to have their teeth treated and put in good condition. I think the strain of having the teeth treated or temporarily filled is less than the suffering from toothache for weeks and months probably.

Dr. B. G. MAERCKLEIN: Will the doctor state what the result was of the extraction of those teeth to cause any injury.

Dr. REINHOLD MAERCKLEIN: I do not know whether that was the direct result, but I do know there was an abortion. I attributed it to the strain caused by the extraction of those wisdom teeth. I should hardly hesitate to say that that was the cause of it.

Dr. C. C. CHITTENDEN: I agree with Dr. Reinhold Maercklein in the matter of the advisability of always doing whatever is possible to relieve pain. There is an axiom in medicine that I think holds good at all times: Anything in reason that relieves extreme suffering is better and less injurious than extreme suffering—any remedy. Of course, we know that during the time of pregnancy there is always a liability to hypersensitiveness if there is anything the matter with any of the dental organs. It has been always my rule, even if the patient was unable to sit up, if possible, to find out the cause; find the reason for the pain; find the seat of it. As we all know, if you can positively diagnose and reach the seat of the trouble in the dental organs producing acute pain, it is very easy, if you go at it right, to give relief. Extraction, of course, is a thing that is sometimes necessary. I have never hesitated to do it under any circumstances where it was absolutely indicated as the one thing needed to be done most; but as a rule it is not necessary to extract any teeth in order to relieve suffering. I think that can be demonstrated. I have demonstrated it to the extent that I do not extract teeth any more, and it is very rarely that a person goes away from my office suffering after I have had a good opportunity to relieve them.

President SOUTHWELL: Where do you send them?

Dr. CHITTENDEN: I don't send them away. You mean for extraction? I send them to any one that wants to do it. I would never hesitate at any time to undertake to relieve pain, because there is far greater liability of trouble from excessive suffering, and from convulsions with neural pain than from the slight operation of bringing about relief. Systemic medication is always indicated where it is possible to help with it. The essayist refers to the general treatment for ptyalism—mercurial ptyalism I suppose was referred to. I wish to speak of a case of ptyalism which I have had within the past two weeks, and which was very marked. If I may be permitted to diverge from the trend of the paper to that extent, I would like to mention a remedy which gave rapid and satisfactory results. The case was presented to me on Thursday, and I diagnosed mercurial ptyalism. Before making any great move in the matter I saw a physician, and found I was correct in my diagnosis. In addition to the ordinary cleansing wash, like listerine or chlorate of potash wash for the mouth, I simply put the patient upon constant hourly or half-hourly rinsing of

listerine and washed with peroxide of hydrogen. The patient had a most horridly fetid and disagreeable breath. He had no comfort in life on account of its disagreeableness. His face was largely swollen wherever there were teeth in the mouth. He was a man advanced in years. In forty-eight hours, by the simple use of peroxide of hydrogen in addition to the listerine, the manifestations of discomfort in the mouth had entirely disappeared.

Dr. T. J. GLENN, Chilton: I wish to say I have extracted teeth in all stages of pregnancy, and in three cases that I have in mind now as late as within two weeks of the time of child birth. I never have had any trouble in that line, but I always insist upon patients taking the responsibility themselves, in case anything should happen; and I have often recommended that they call in their family physician, so that in case if anything should happen we have a physician at hand. I also wish to say that I have had considerable trouble with arsenical paste in cases of pregnancy. It seems to have little or no effect upon the pulp. I have applied it as carefully as I have in other cases where there is no pregnancy, but it did not seem to have the same effect. It will in time destroy the pulp, but it takes a long time, and in the meanwhile there is considerable pain, sometimes excruciating pain. I should like to hear from other members of the society on that, as to what has been their experience with arsenical paste in cases of pregnancy.

Dr. REINHOLD MAERCKLEIN: The case that I referred to that resulted in that way was not in the latter stage of pregnancy. It was in the early stage, just how long I could not say. I have never had any trouble with any case that was farther advanced, but this was a case that was just in the early stage of it. So far as arsenic goes, I have made but very little trial of it. I think if we could get into the congestive pulp, break up the congestion so as to puncture the pulp and get it to bleed; then apply our paste and produce no pressure by sealing the cavity, we would have very little pain. I have found a great deal of pain often in applying arsenious acid, without any other conditions present but just a congestive pulp. If you can get rid of that congestion and pack the cavity without producing pressure upon the pulp I think we will get little pain. I attribute pain to pressure, where we have an inflamed and congested pulp, and then applying arsenious acid; in such cases I expect to get a good deal of pain.

Dr. T. J. GLENN: I always aim to put arsenious acid into a

cavity as carefully as possible and cover it with cement, or something that produces no pressure whatever upon the pulp. What I was speaking of was the trouble I have had in cases of pregnancy with destroying the pulp; more so than in other cases treated in the same manner. I wished to hear if other members of the profession have had the same trouble, or whether it is only imaginary on my part, whether it has only happened so.

Dr. B. G. MAERCKLEIN: I think the doctor is right about the results that he has had, when he has ascribed another cause for the failure. I do not think pregnancy is altogether at the bottom of it; excepting so far as it is the result of the original irritation, and we know that patients of that class are generally timid, and hesitate a long time before they will apply for relief. When they come to the dentist the pulp has been slightly irritated for some time, and has become congested, or in a condition which resists medication. It need not necessarily be pregnancy. Any pulp that has been undergoing that process and has arrived at that condition will resist, and often successfully, the application of arsenious acid. I have had cases in men where its application had almost no effect. I have had one case where it took over three months to destroy the pulp. It cauterized practically a little of the surface of the pulp where it touched, and that would limit its effect. Following that observation farther I found it to be the result on all irritated pulps of long standing. I have now adopted the practice of first reducing that irritation; and I have sometimes treated that class of pulps for weeks before I made an application to destroy it. If the doctor will follow that practice I think he will overcome a great many of the difficulties he has met with. Arsenious acid is an irritant. The pulp being already irritated to an extent to resist it, it will not absorb or take it up so as to destroy it. It simply resists and throws it off. I have had all sorts of cases of that kind, and I think that the proper practice is to first give relief, get them quieted down, use some sedative, anything you may have; oil of cinnamon, oil of cloves, carbolic acid, tincture of iodine, tincture of aconite. After you have reduced all of the inflammation, and the pulp is perfectly comfortable, apply arsenious acid and there will be no trouble in destroying it.

Dr. JAMES T. STEWART, Milwaukee: I have had quite a number of extractions during pregnancy, and have never had any serious results. Of course we defer any operation under those

circumstances as much as we can ; but in those cases in which it has been impossible for me to relieve the patient of suffering, I have extracted. Of course by the puncture of an abscess or devitalization of the pulp, or anything of that kind, if we can relieve our patient it is so much the better, for we can defer the extraction ; but I contend that unless we do succeed in relieving the patient we should extract the tooth, and, as I say, I have had no serious results.

In regard to the application of arsenious acid, my experience has been very gratifying. Dr. Maercklein suggests the proper idea : We must relieve the inflammation of the pulp before we attempt the application of arsenious acid. As he says, it sometimes requires considerable treatment. I have sometimes succeeded in from twenty-four to forty-eight hours. It sometimes took several days before I made an application ; but after I applied it the results have been gratifying. Reduce the inflammation as much as possible, then apply the arsenious acid absolutely without pressure, closing the cavity without pressure, in most cases by the application of the rubber dam and mixing the cement very thin and allowing it simply to flow down over the arsenious acid. Leave it until it is set, and you have no eschar around the gum. I have never had to apply arsenious acid to a tooth a second time, but once; the other times removing the pulp almost without pain.

Dr. L. J. STEPHEN, Milwaukee : I fully agree with the remarks of Drs. Stewart and Maercklein on this subject. I never had any trouble in devitalizing a pulp, and have had very little pain connected with the operation, where the inflammation was reduced before applying the arsenious acid. In cases where it has not acted well there may have been, possibly, some other obstructions, such as pulp stones. I would like to ask the essayist whether he has looked into that matter.

If I may be permitted to diverge somewhat from this subject I would like to say that we all recognize in Dr. Harlan an authority on the subject of internal medication. In the last numbers of the dental journals he enthusiastically recommends the use of fluid extract of Jamaica dogwood as a sedative. I understand that quite a number of the gentlemen present have made use of that drug, and I would like to hear from them as to the results.

Dr. G. J. GLENN : I have found pulp stones, upon investi-

gation, in some cases. As to this matter of reducing the inflammation before the arsenious acid is applied ; of course, in a great many cases we can do it, but where the practice is largely from the country they will insist that they cannot come in another time, so we have to do the best we can under the circumstances.

Dr. E. A. GEILFUSS, Milwaukee : In response to the question of Dr. Stephen in regard to the fluid extract of Jamaica dogwood, I will state that I have used it in three different cases without very flattering results. I used both the fifteen and the thirty drops in water, as recommended by Dr. Harlan, and so far as I was able to judge it had no effect.

Dr. C. P. DEMING, Ashland : I would like to say that I have used fluid extract of Jamaica dogwood, in fifteen or twenty cases, with very marked results. I think, however, it requires a little longer time to get the benefits than he states in the paper; say half an hour.

President SOUTHWELL : This will probably result in an experience meeting, before we get through with this subject. I read the article on fluid extract of Jamaica dogwood, and I took the remedy internally about fifteen minutes before the operation. I took fifteen drops. I got to the swearing period before the dentist got through. The next time I took forty drops. I cannot say that it was anywise beneficial. I have tried it once or twice on patients. I have not had any good results as yet, but I am not going to be discouraged. If it is necessary to wait half a hour I am going to try that; but the fifteen minute limit has not been a success in my hands.

Dr. A. H. PECK, Chicago : I have had some experience with fluid extract of Jamaica dogwood. Like the others who have spoken on the subject, in some cases I have had good results ; in others not so good. There is no question about the efficiency to a certain extent of this drug as a nerve sedative; but it certainly does not produce the results that some expected of it when it was first introduced into practice. I know a great many others who have used the drug, and their experience as a rule seems to be about the same. In some cases it seems to work nicely; in others the results are not what might be desired, or expected even. Dr. Deming spoke about the time which should be permitted to elapse after administering it previous to beginning the operation. I have also had this same experience. Fifteen minutes, as a rule,

is too short a time. Thirty minutes is better, and in some cases I have even waited three-quarters of an hour. In those cases as a rule I have had the best results.

President SOUTHWELL: How many drops do you use generally?

Dr. PECK: I have used as a rule twenty drops; usually not less.

Dr. W. C. WENDEL, Milwaukee: It was not my intention to speak on this subject at all, but if there is any hypnotist here or anybody in favor of fluid extract of Jamaica dogwood I would like to have him operate upon me. It is well enough to work upon the feelings of the patient and try to hypnotize him, but if you give them a little sodium chloride in solution it will have about as agreeable an effect. The dogwood is certainly a nerve sedative and perhaps might quiet the nerves of the patient, but I do not think it is effective in allaying sensitive dentine.

Another thing: A great many will administer the drug, apply the rubber dam, and then wait half an hour. If they would do this under ordinary circumstances without the Jamaica dogwood, I think it would have almost the same effect. Then again, one patient will have extremely sensitive nerves and it does not work very well. You simply say it is the patient's idiosyncrasy. You take another person who is perfectly quiet, and the tooth may not be sensitive and you say the drug is effectual. Now I have had but very little faith in Jamaica dogwood as an effective remedy to allay sensitive dentine. If any one here wishes to demonstrate it I will give him an opportunity, especially those who were successful. I have heard our Chicago friend, Dr. Peck, state that it is necessary to take fifteen to twenty-five and thirty minutes for the effectual administration of the drug. I understand from Dr. Banzhaf that he has administered to forty different patients, kept a correct record, and that the drug had a decided effect inside of five minutes. Now these are conflicting statements, therefore I have not as much faith in it as a great many of our professional brethren have. It has been spoken of in all the magazines, and I expect every one has tried it. You can take as large a dose as you please. You can run up to 120 drops. I do not know but what a strong man could take 200 drops. I have used it upon patients, and used it upon myself while operating, thinking that from the sympathy between the two of us we might allay the severe pain,

but the patient said I could not hypnotize him. He said, "Bring on the whole bottle."

Dr. B. G. MAERCKLEIN: As long as we have a subject to become a martyr to the science of dentistry and medicine who says he is willing to undergo the treatment of the successful ones, I would suggest that he place himself in the hands of all those who consider themselves successful, beginning with those who have had good results in five minutes, following with ten and then with fifteen, topping off with Dr. Peck at forty-five minutes, and watch the results. We will all be here and see the clinic to-morrow.

Dr. PECK: I understood that I was asked to give my experience with this drug and that I did. Now I will say further, that I am not here as an advocate of the use of the fluid extract of Jamaica dogwood for this purpose. The uses that I have made of it have been along experimental lines. I have experimented with it and used it for the purpose of satisfying myself whether or not it was a practical agent for this purpose. I have come to the conclusion, everything considered, that it is not, and have abandoned its use, so I will let the doctor off with my part of the clinic at least. It takes too long as a rule before any effects are manifested. That is one good reason why it is impracticable. There are not many patients that desire to sit in a chair for fifteen, twenty, thirty, or forty-five minutes without having any work done. That is too much time to waste. But, as I said before, that it does possess sedative properties there can be no question. It acts entirely upon the nerve centers, not upon the nerve filaments, throughout the different portions of the body. We must all agree that if the nerve center, in the medulla for instance—the sensitiveness of that is blunted or done away with, that the sensitiveness which otherwise would be manifested in the nerve filaments will also be done away with to a greater or less extent. That must necessarily follow, and that is the way it acts, not directly upon the dentine or the sensitiveness in the dentine.

Dr. A. H. Peck, of Chicago, then read a paper (see page 623).

DISCUSSION.

Dr. B. G. MAERCKLEIN, Milwaukee: The essayist has covered the ground so thoroughly and so perfectly that there remains very little to be said on the subject. Hardly any comment can be made upon it except to agree with him in nearly every detail.

There is one point I would like to emphasize. After having gone through the treatment as he has described it, fill the root canal of a tooth with a fistulous opening before that opening closes. I advocated that practice before this society some eighteen or twenty years ago. When I first made mention of it I was laughed at. I have had the pleasure of having quite a number of the members of this society tell me afterward that they had followed that same practice with good results. At that time we were always treating abscesses until we cured the fistulous opening, and after that was perfectly healed or cured we would fill the root canal, and any particle of filling material which passed through the apical foramen would again produce an abscess. I discovered that process as a matter of necessity, in filling root canals when I went out in the country, the patients not having the time to wait until the abscess was cured. I tried it afterward in practice in my office, and had universally good results. As the essayist has indicated, 99 per cent of that class of teeth can be cured in a very simple manner, and I have always filled the root canal before the abscess is healed, or at least before the fistulous opening on the gums had healed. There was one point in the paper that I did not understand clearly, where the essayist stated that one could force carbolic acid or some of the other medicaments through the opening of the foramen into the pus sac without a fistulous opening. Did I get that correctly, doctor?

Dr. PECK: Yes, sir.

Dr. MAERCKLEIN: That is a practice I have always dreaded. And I have asked members of this society to give me some indication of when that would be right, and when it would be wrong. If there is anything that I dread to handle it is a blind abscess. Personally, I know not when they are thoroughly cured. I have treated them sometimes for weeks, and sometimes for months, supposed them to be cured, and then after filling, have an another abscess form. Dr. Farrar, of New York, I believe, called attention to that class of cases some years ago. He says: When you have thoroughly cleansed a root canal, fill it, regardless of whether you have cured the blind abscess above the apex or not. If an abscess should form, drill through the gum and alveolar process, and give an opening to it, as though the fistula had already been tapped. I hesitate to force anything into a blind abscess. I have never practiced it to any extent with good results. I have always had

bad results. It is possible that the essayist has been more successful with different medicines, and has achieved results there that are worth knowing.

There was one other point, a deodorizer, electrozone, that is claimed by the doctor to be the remedy *par excellence*. Permanganate of potash will do the same thing.

Dr. CHITTENDEN: It is absolutely nonirritant.

Dr. MAERCKLEIN: You can use it as strong or as weak as you please. You could give the patient a tumblerful and let him rinse his mouth. To my knowledge at least, it is one of the best of remedies for this purpose. I have not used electrozone, but I am going to try it.

Dr. G. C. KOLLOCK, Madison: I have had a number of blind abscesses where the opening through the apex was so small that I could get no discharge through it. The only way I could do it was to cut through and clean out through this opening.

Dr. CHITTENDEN: I have enjoyed Dr. Peck's paper, and as Dr. Maercklein has very properly remarked, it absolutely covered the whole ground. I was particularly pleased with Dr. Peck's selection of carbolic acid as his choice as an antiseptic in the general handling of alveolar abscesses. I suppose in speaking of a 95 per cent solution of carbolic acid he meant one whose dilution is made by the use of alcohol rather than glycerine. How is that, Dr. Peck?

Dr. PECK: Alcohol.

Dr. CHITTENDEN: With reference to the use of carbolic acid in the treatment of blind abscesses—to reach the point which Dr. Maercklein speaks of—in the use of a medicament I did not like to have them pass through the foramen into the blind abscess; but if access is free, I have no hesitation in sending peroxide of hydrogen directly through. If there is an opening, as there usually is, the patient can relieve himself by sucking upon the cavity and drawing away the pressure. But once having thoroughly cleaned a blind abscess, and it can be done if the canal is opened through, with peroxide of hydrogen, you may put a 95 per cent solution of carbolic acid into it and leave it there, and it will cure an abscess almost universally. I would not put in "One, two three," nor would I put in oil of cassia and such things. They are stimulating and irritating, while carbolic acid is not.

Dr. W. C. WENDEL, Milwaukee: I was very much pleased

with Dr. Peck's paper. I do not wish to follow up the pathological conditions of the case, but simply refer to the treatment. I was under the impression that Dr. Peck said that he would in certain cases force cotton with the medicine through the apical foramen. Did I understand you right?

Dr. PECK: No, sir; pack the medicated cotton thoroughly, so as to force a little of the medicament through the foramen.

Dr. WENDEL: There would be danger in such cases of having particles remain at the apical foramen; the tissue would not take it up. We very often have tortuous roots. We have canals which are almost impossible to penetrate with the smallest probe, or without the greatest amount of danger. I do not think it safe to undertake to use a Gates drill, or any other drill, to make an opening through a tooth for a blind abscess.

Another thing, in trying to force a medicament through into the pus sac, we receive such a resistance that we would have an actual piston there, and would produce more injury than by letting it alone. I would rather anæsthetize the soft parts and drill through to the apex, than to undertake to force a medicament through the apical foramen into a blind abscess. One thing, I must thank Dr. Peck particularly for, and that is his endorsement of carbolic acid, so highly.

Dr. L. J. STEPHEN, Milwaukee: I would like to ask Dr. Peck whether in cases of blind abscess, where the foramen is rather small, he opens up into it and enlarges it, so as to freely admit the medicament? The injection of peroxide of hydrogen into the closed sac I should think would cause excruciating pain, unless the opening was sufficiently large to allow free access.

Dr. PECK: In such cases I never hesitate to enlarge the opening. That is one thing which I tried to emphasize in my paper. We must not try to work through a small opening, especially in the root canal, with the intention of getting good results, or the best possible results obtainable. If the canal itself is small, or more or less tortuous, and I cannot work in it satisfactorily, I enlarge it and also the foramen. But I do not believe in the use of drills in root canals. I should not undertake to enlarge by that means. Sulphuric acid, chemically pure, properly used, will enlarge these canals, and also the foramen nicely and without any trouble at all, if it is properly used, mind you. You cannot expect to use a large quantity of the acid, or anything of that sort,

just a small amount. It readily dissolves the organic matter in the tooth substance, so that it is easily removed with a broach. Donaldson's nerve cleanser it is called. By working slowly and gradually in this way the canal can be nicely and effectually opened in the great majority of cases.

As regards forcing the remedy through the foramen into the pus cavity: If the foramen is large, or large enough so that I can work reasonably well, I never hesitate to force the remedy through, if I want to do that, whether peroxide of hydrogen or carbolic acid, or anything else. The pus, of course, must be thoroughly removed first, or as nearly as possible. Force it all out, and then a little peroxide of hydrogen in that pus cavity will cause very little trouble. If there is much pus remaining so that because of the expansion, or the action of the peroxide upon the pus, severe pain results, pass your broach down through the foramen, open it up, and that trouble will cease in most cases almost instantly; because it allows an escape through the foramen, instead of keeping it pent up in the pus pocket.

Dr. CHITTENDEN: Cannot the patient draw it out, by sucking it out?

Dr. PECK: Certainly the patient can aid a great deal by that process.

Dr. STEPHEN: Do you use it chemically pure, or 75 per cent?

Dr. PECK: Chemically pure.

Dr. STEPHEN: In all cases where you open it up by means of sulphuric acid?

Dr. PECK: Yes, sir.

Dr. STEPHEN: In the use of carbolic acid do you inject repeatedly, or simply as an heroic measure?

Dr. PECK: I usually get the result desired the first time.

Dr. STEPHEN: Owing to the anæsthetic effect would it not have a tendency, when granulations begin to form, to destroy these granulations?

Dr. PECK: After the first treatment you will find that there is no pus—or at any rate after the second or third sitting. After you have opened through the foramen, and find no pus present, do not use those remedies. They are not necessary. Let the case alone, and give it an opportunity to heal.

Dr. STEPHEN: Do you use electrozone proper, or the medicinal preparation, meditrina?

Dr. PECK: The medicinal preparation.

Dr. STEPHEN: You know the electrozone is the common article made, while the meditrina is the medicinal preparation.

Dr. PECK: Yes sir. The brand called electrozone is almost as good as the other now. The article called electrozone, at the present time, is not by any means the crude article that we first had.

I wish to say in this regard that permanganate of potash is a most excellent remedy as a deodorizer, and is very cheap. Electrozone is cheap, and to my mind is far ahead of the others. You take an old crown or an old piece of bridge work, or anything of that sort that you may be repairing, and you know the odor is almost unendurable. If you drop it into electrozone that odor is instantly destroyed. Electrozone is a nonirritant. It is entirely harmless. The patient may drink it and suffer no ill results.

Dr. ANDREW BAILEY, Menominee, Mich.: I have used meditrina and electrozone, and I find meditrina reduces pericementitis better than almost anything I have tried. I prefer it to aconite and iodine. I had a case of pericementitis which was five or six years old before I saw it. I tried the old standard remedies for some time without results. I used meditrina, and I think I treated it for about ten days and cured it.

Dr. JAMES T. STEWART, Milwaukee: I want to endorse what the essayist said about sulphuric acid. I have been using it for two years and I found that canals that had heretofore given me an infinite amount of trouble, were comparatively easy. I get it officinally pure, and make a 50 per cent solution, and I find it is very easy to use with a barbed nerve broach.

Dr. B. DOUGLAS, Appleton: If I understood Dr. Maercklein right he was at a loss to know when he had performed a cure in blind abscess.

Dr. MAERCKLEIN: Yes sir; that is right.

Dr. DOUGLAS: Perhaps I can give you a hint that will be a help to you. If you will take the point of your finger and press over that blind abscess, or where it was, or the one you suppose you have cured, and it becomes a livid color immediately, and it stays so for a time, you will find that you have not performed a cure. You cannot do that on any other part of the gum and produce the same result.

Dr. STEPHEN: I do not think it would be diverting from the

subject if I would ask Dr. Peck to state what filling material he used as a rule in root canals.

Dr. PECK: Gutta-percha.

Dr. STEPHEN: In most all cases?

Dr. PECK: Almost invariably.

Dr. CHILSON: That doesn't mean chloro-percha?

Dr. PECK: No, sir; that means solid gutta-percha. That is, after the operation is finished it must be solid.

Dr. STEPHEN: In case of opening the root canal and enlarging the apex I rather think the only filling we could use for filling the canal would be gutta-percha. I have filled canals with oxychloride of zinc.

Dr. W. C. WENDEL, Milwaukee: I think that question is outside of the subject under discussion. There are two factions upon that subject, and it has been boiled and hashed and everything, and I think it is advisable to pass the discussion.

A paper by R. J. Wenker was then read (see page 644).

A paper by O. C. Moon was then read (see page 630).

DISCUSSION.

Dr. B. G. MAERCKLEIN: I was obliged to be absent just in the beginning of the reading of the paper, and I would like to ask the essayist where the injury was.

Dr. O. C. MOON, Beaver Dam: The slug struck just to the left of the median line, carrying away the central part of the jaw, and the central, lateral and cuspid teeth, passing on into the back part of the neck.

Dr. MAERCKLEIN: Of course, not being familiar with the injury to the soft parts, or whether the entire bony parts were destroyed, crushed by the missile or not.

Dr. MOON: They were.

Dr. MAERCKLEIN: It would have been good practice to have simply bandaged the jaw in such a manner as to hold the parts in their proper articulation against the upper teeth. The lower jaw particularly is very prone to a reproduction of bone; and if the space had been kept open, the teeth articulated firmly against the upper jaw, it is just possible that a large portion of this open space would have filled in with new bone. The lower jaw is particularly, as I say, well adapted to that purpose, and there seems to be a peculiarity inherent in its composition to reproduce new

bone in injuries of that kind. It might have been tried. The very worst that might have followed would be not to have had union. You certainly would not have had union so quickly under any circumstances, but you might possibly not have had union at all. Then it might have been wired together at any future time, or a secondary operation performed to unite the jaw at the symphysis. But it probably would have resulted in better articulation with the upper teeth than at the present time; while the jaw swung together, the teeth would have remained more upright, and possibly a little outward, when the natural contraction of the healing process had occurred, in drawing the lower edges of the jaw, one part to the other.

In reference to the extraction of teeth on either jaw at the present time, I do not think I would advise it, if the teeth are healthy. I think the method pursued, in placing an upper plate inside of the upper teeth, and allowing the lower ones to articulate against it, is possibly the best thing that could be done, except perhaps a gradual expansion of the lower teeth might be resorted to, in order to bring them back to their normal condition, and occlusion with the upper teeth. That, however, would be largely determined by the present condition of the jaw and by the general condition of the health of the patient.

Dr. E. A. GEILFUSS, Milwaukee: I should like, in connection with this paper, to ask what the gentlemen here present would have done in a case that came under my observation some time ago. A gentleman living in the interior of the State came to the Milwaukee hospital to submit to an operation for cancer. At the time it was supposed that the disease had attacked only a very small portion of the inferior maxilla; but while under the anæsthetic it was found necessary to remove the larger part of the right side of the inferior maxilla; and after the wound commenced to heal naturally, the muscles drew up the jaw in such a way that it was difficult for the man to get along at all; that is, to get any means of subsistence. He had to live on liquid food entirely. He was recovering, and he wanted something, if possible, to replace that portion of the bone. I saw the case several times. I took an impression, and was going to try to make some sort of an appliance to fit, and keep that apart; straining the muscles, and keeping them from contracting, but before anything could be done the patient had to submit to another operation. I believe now that

he is dead. The cancer had extended too far, and impregnated the system. What could have been done in that case? Would a denture have been at all successful? I never saw the report of a similar case.

Dr. B. G. MAERCKLEIN: Was the entire body of the jaw removed; sawed off transversely?

Dr. GEILFUSS: It was removed from the first right bicuspid up to about the middle of the ramus, entirely removed.

Dr. MAERCKLEIN: No denture or appliance of any kind would do much good.

The report of the master of clinics was then read by Dr. Mueller, as follows:

Dr. B. G. Maercklein, of Milwaukee, demonstrated the use of Dr. Sackett's new inhaler designed to be used in operations in the mouth. It is so constructed that the patient can inhale the anæsthetic through the nostrils without obstructing the mouth after the surgeon has commenced the operation. Dr. Sackett volunteered to be the subject for the experiment and was completely anæsthetized in four minutes, inhaling the chloroform only through the nostrils and only a very small amount of the anæsthetic having been used.

Dr. R. G. Richter, of Milwaukee, demonstrated the use of Schleich's infiltration method of local anæsthesia, by removing some carious bone and cutting off the ends of roots of two teeth. The affected part extended from first bicuspid on the left side of upper jaw under apex of the root of the cuspid, and took a downward course and discharged through a fistulous opening over the lateral incisor. After the parts were anæsthetized the gum was dissected so as to expose the affected parts. A chisel was used to break the adhesion of gum. Then a fissure bur was used and the upper end of the root of the cuspid amputated. Then a round bur was used and all carious bone cut out, including tips of roots of first bicuspid as far as they were denuded of peridental membrane. Then a spoon-shaped excavator was used and the carious bone scraped from root of lateral incisor. The reason for this was to not injure the nerve of the lateral incisor which was alive. The cavity was washed out with carbolyzed solution and packed with iodoform gauze. The operation was painless as far as the territory was anæsthetized. The whole operation took less than ten minutes.

Dr. W. J. Maercklein, of Milwaukee, took the impression for a full upper and lower set of teeth of a very difficult case and showed his way of trimming models and getting the bite. He also showed a case on which he operated a year ago, showing an improved condition of mouth surfaces under fixtures then placed there.

Dr. R. R. Powell, of Janesville, inserted a large filling in a left upper first molar. The cavity involved the anterior proximal and crown surfaces. Two-thirds of the cavity was filled with Rowan's cylinders and the rest was finished with Williams' gold and platinum foils, making a very hard surface. The electric mallet was used in condensing the gold. The operation was in every respect a creditable one to Dr. Powell's skill.

Dr. C. T. Pierce, of Janesville, filled a right lower bicuspid posterior proximal cavity with alloy, using the Peterson matrix and without rubber dam. The filling was nicely contoured and the margins were left smooth.

Dr. A. L. Bentz, of Madison, filled a left upper molar with alloy. The cavity involved the crown and lingual surfaces. The principal merit of the operation consisted in the thoroughness with which the fissures were treated to prevent further decay.

Dr. Robert Maercklein, of Milwaukee, filled a left lower bicuspid crown cavity with gold for Dr. Wendel.

Dr. E. B. Owen, of Brodhead, filled three cavities with cement for Dr. Gatterdam. The principal interest about these two cases was the use in each of the electrical medication of the cavities, with a view to obtunding exceeding sensitiveness by the use of cataphoresis. As the evidence of the two subjects is somewhat conflicting as to results, I would respectfully call upon these two gentlemen to report what effect the new process had upon lessening the pain.

On motion, the report was accepted.

At different sessions the usual miscellaneous business was transacted, officers elected, etc., after which the society adjourned.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The thirteenth annual meeting of the National Association of Dental Faculties was held at the Grand Union Hotel, Saratoga Springs, commencing August 1, 1896.

The following colleges were represented:

Birmingham Dental College—T. M. Allen.

University of Denver, Dental Department—W. E. Griswold.

Columbian University, Dental Department—H. C. Thompson.

National University, Dental Department—J. Roland Walton.

Atlanta Dental College—Wm. Crenshaw.

Southern Medical College, Dental Department—Frank Holland.

Chicago College of Dental Surgery—T. W. Brophy and Louis Ottofy.

Northwestern College of Dental Surgery.—L. L. Davis.

Northwestern University Dental School—Theo. Menges and Geo. H. Cushing.

Indiana Dental College—G. E. Hunt.

Louisville College of Dentistry—Francis Peabody.

Baltimore College of Dental Surgery—B. Holly Smith.

University of Maryland, Dental Department—F. J. S. Gorgas.

Boston Dental College—J. A. Follett.

Harvard University, Dental Department—Thos. Fillebrown.

University of Michigan, Dental Department—J. Taft.

Detroit College of Medicine, Dental Department—G. S. Shattuck.

University of Minnesota, College of Dentistry—Thos. E. Weeks.

Kansas City Dental College—J. D. Patterson.

Western Dental College—D. J. McMillen.

Missouri Dental College—A. H. Fuller.

University of Buffalo, Dental Department—W. C. Barrett.

New York College of Dentistry—Frank Abbott.

Cincinnati College of Dental Surgery—W. T. McLean.

Ohio College of Dental Surgery—H. A. Smith.

Cleveland University of Medicine and Surgery, Dental Department—S. B. Dewey.

Western Reserve University, Dental Department—H. L. Ambler.

Pennsylvania College of Dental Surgery—C. N. Peirce.

Philadelphia Dental College—T. C. Stellwagen and S. H. Guilford.

University of Pennsylvania, Dental Department—E. C. Kirk.

University of Tennessee, Dental Department—J. P. Gray.

Vanderbilt University, Dental Department—H. W. Morgan and W. H. Morgan.

University College of Medicine, Dental Department—L. M. Cowardin.

Royal College of Dental Surgeons of Ontario—J. B. Willmott.

The following colleges were elected to membership :

Howard University, Dental Department, Washington, D. C.—James B. Hodgkin.

Marion Sims College of Medicine, Dental Department, St. Louis, Mo.—J. H. Kennerly.

Dental Department of Tennessee Medical College, Knoxville, Tenn.—R. N. Kesterson.

The following applications for membership were reported favorably by the Executive Committee for final action next year:

University of Omaha, Dental Department, Omaha, Neb.; Ohio Medical University, Dental Department, Columbus, O.; Baltimore Medical College, Dental Department, Baltimore, Md.; Dental Department of Milwaukee Medical College, Milwaukee, Wis.

The New York Dental School announced its intention to complete its application next year.

The report of the secretary stated that there were in the United States fifty-three institutions teaching dentistry or conferring the dental degree, as follows: Dental schools in active operation, forty-six; organized during the year, two; in course of organization, one; corporations conferring the dental degree, four. Of the dental colleges, thirty-six were now members of the association, eight had applications for membership pending, two had signified their intention of applying, and the two newly organized have announced in their catalogues their intention to comply with the rules of the association.

The report of the committee on schools, presented by its chairman, Dr. Follett, stated that reports had been received from thirty-five schools as to their equipment under the resolution adopted last year. These reports showed that the schools were well provided with lecture rooms, and in most instances with ample labora-

tory and dispensary accommodations, with sufficient and appropriate appliances. They indicate a broadening in the general course of instruction, as well as fuller courses in all departments. Several colleges have recently added courses in bacteriology and extended their work in histology and pathology in practical ways. During the year 1895-1896, the number of matriculates at the thirty-five colleges reporting was 5,532; graduates, 1,363.

Mr. Melville Dewey, secretary of the Board of Regents of the University of New York, appeared before the association by invitation of some of the members, and gave a masterly address on the needs of the movement for higher education in professional ranks. Incidentally, Mr. Dewey explained some of the details of the system pursued in New York, and stated that, greatly to the surprise of those in charge of the various professional educational institutions in the State, the number of students had steadily increased since the higher requirements had been put into force by the Board of Regents.

Among the more important legislation enacted by the association were the following:

REGULATING THE ADMISSION OF STUDENTS.

PRELIMINARY EXAMINATION.

The following preliminary examination shall be required of students seeking admission to college of this association :

—————HIGH SCHOOL.
————— 189

To the faculty of—————

M ——— desires to present ——— self as a candidate for admission to the Course of Dentistry, ——— ———

————— has pursued in this school the branches against which numbers appear—the number being the standings upon a scale of 100. Our course requires five recitations or exercises weekly, in each branch. Our terms are ten weeks in length.

PRELIMINARY.

2 terms Orthography, standing.	2 terms Grammar.
2 terms Reading, standing.	2 terms History U. S.
2 terms Writing,	—
2 terms Arithmetic.	14
2 terms Geography.	

These are required in all cases, and fourteen counts given for the same.

ELECTIVE.

3 terms University Algebra,	1 term Commercial Arithmetic.
through Quadratics.	2 terms Astronomy.
3 terms Geometry, plain and solid.	2 terms Geology.
2 terms Physiology.	2 terms Natural History.
2 terms Physical Geography.	1 term Political Economy.
1 term Botany, with analysis of	2 terms Drawing.
forty plants.	3 terms German.
3 terms General History.	3 terms Greek.
3 terms Natural Philosophy.	3 terms Latin Reader, Cæsar.
3 terms English Literature.	3 terms Cicero, four orations.
2 terms Civil Government.	3 terms Virgil, six books.
1 term Rhetoric.	1 term Book-keeping.
2 terms History of England.	3 terms French.
3 terms American Literature.	2 terms Manual Training.
3 terms Chemistry.	

(After session of 1900-1902 U. S. History becomes elective, and entitles to two credits.)

FOR THE SESSION OF 1897-98.

Preliminary.	. . . . .	14 counts.
Elective.	. . . . .	18 counts.
		—
Total		32

FOR THE SESSION OF 1898-99, 1899-1900.

Preliminary.	. . . . .	14 counts.
Elective.	. . . . .	27 counts.
		—
Total		41

FOR THE SESSION OF 1900-01.

Preliminary.	. . . . .	14 counts.
Elective.	. . . . .	36 counts.
		—
Total		50

For the session 1901-1902 and thereafter no preliminary credits; forty-eight credits from the studies classed as elective.

When the text-book mentioned has not been completed, the exact amount of work done should be stated.

The candidate above named is recommended as of good moral character, studious habits, and, judging from the past records, able to carry forward the work of a dental college course.

The rules for the admission of students take effect with the session of 1897-98.

— — — Principal.

ADMISSION TO ADVANCED GRADES ON CERTIFICATES.

The colleges of this association may receive into the advanced grades of juniors and seniors only such students as hold certificates of having passed examinations in the studies of the freshman or junior grades respectively, such certificates to be pledges to any college of the association to whom the holders may apply that the requisite number of terms have been spent in the institutions by which the certificates were issued.

INTERMEDIATE CERTIFICATES.

Place

Date

This certifies that———has been a member of the———
class in the———during the term of———

He was examined at the close of the term in the required studies, as stated herein, and is entitled to enter the

Freshman Year

Junior Year

[List of Studies.]

[List of Studies.]

This certificate shall by correspondence be verified by the dean of the college by which it was issued. Without such certificate no student shall be received by any college of this association for admission to the advanced grade, except on such conditions as would have been imposed by the original school, and these to be ascertained by conference with the school whence he came.

LIMITING THE TIME FOR THE RECEPTION OF STUDENTS.

No member of this association shall give credit for a full course to students admitted later than ten days after the opening day of the session, as published in the announcement.

In case one is prevented by sickness, properly certified by a reputable practicing physician, from complying with the foregoing rule, the time of admission shall not be later than twenty days from the opening day.

In cases where a regularly matriculated student, on account of illness, financial conditions, or other sufficient causes, abandons his studies for a time, he may reënter his college at the same or subsequent session, or where under similar circumstances he may desire to enter another college, then with the consent of both deans he may be transferred, but in neither case shall he receive credit for a full year unless he has attended not less than seventy-five (75) per cent of a six months' course of lectures.

ATTENDANCE, EXAMINATIONS.

Attendance upon three full courses of not less than six months each in separate academic years shall be required before examina-

tion for graduation. The year shall be understood to commence August 1, and end the following July 31.

Beginning with the session of 1896-97, the examinations conducted by the colleges of this association shall be in the English language only.

A student who is suspended or expelled for cause from any college of this association shall not be received by any other college during that current session. In case the action of the first college is expulsion, the student shall not be given credit at any time for the course from which he was expelled. Any college suspending any student shall at once notify all other members of this association of its action.

APPLICATIONS FOR MEMBERSHIP.

Applications for membership in this association shall be made in writing, favorably indorsed by the faculties of two or more colleges of the association and the board of dental examiners of the State in which it is located.

Such application shall then be referred to a special committee of three which shall be appointed by the chair upon each application. The duty of this committee shall be to visit the school applying during its session, personally examine its facilities for teaching, methods of instruction, and efficiency of the faculty, and report to the executive committee, which report shall, if favorable, be acted upon.

Each application shall be accompanied by a sum of money sufficient to defray the expenses of the special committee.

The constitution was so amended that hereafter it will require a two-thirds vote instead of a majority to elect new members.

The following resolution, offered by Dr. Peirce, was on motion, adopted:

WHEREAS, In view of various reports frequently being circulated derogatory to the character of certain schools, without any one being willing to prefer charges sustaining such statements,

Resolved, That the Executive Committee be and is hereby authorized to exercise full power to investigate all such innuendoes or charges by visiting the school or schools, or authorize some one to perform this duty; summoning witnesses, etc., in order that all such statements shall be sustained or proven false.

Resolved, That a sum to be determined by the officers, president, secretary and treasurer, be and is hereby appropriated for the purpose of paying expenses essential to the carrying out of the provisions of the above resolution.

The following communication from the National Association of Dental Examiners was read and on motion, adopted:

Resolved, That this association requests the National Association of Dental Faculties to enact a rule prohibiting colleges from receiving beneficiary students recommended by State boards and associations.

The following, offered by Dr. Abbott, was adopted :

Resolved, That the committee of three appointed by the chair to report on applications for membership shall determine and report to this association at its next meeting the minimum requirements of such colleges as desire to become members of this association as to length of course, plant, equipment, facilities for teaching, and the number and efficiency of its faculty.

Dr. Brophy offered the following, which was adopted :

Resolved, That a graduate of a recognized dental college, who applies to a college of this association for the degree of Doctor of Dental Surgery or Doctor of Dental Medicine, shall complete one full course of instruction in said college and comply with all other requirements of the senior class.

The following lie over till next year for final action :

Offered by Dr. Barrett :

Resolved, That after the regular session of 1897-98 the annual college term for the members of this association shall be seven full months.

Resolved, That it is advisable that the National Association of Dental Faculties in future meet in connection with the National School of Dental Technics at a time of year when the colleges are in session, and before the time for the issuance of the annual catalogues.

A committee, consisting of Drs. Patterson, H. W. Morgan, and Kirk, appointed to consider the advisability of adopting the academic cap and gown for commencement day, reported in favor of adopting the intercollegiate system and in favor of lilac as the distinguishing color for dental schools. Laid over till next year.

The following were elected officers for the ensuing year : J. P. Gray, Nashville, Tenn., President ; Truman W. Brophy, Chicago, Vice President ; Louis Ottofy, Chicago, Secretary ; Henry W. Morgan, Nashville, Tenn., Treasurer ; J. Taft, Cincinnati, Thomas Fillebrown, Boston, and B. Holly Smith, Baltimore, Md., Executive Committee ; H. A. Smith, Cincinnati, Thomas E. Weeks, Minneapolis, and J. D. Patterson, Kansas City, Mo., *ad interim* committee.

The newly elected officers were installed, and the president announced the standing committees as follows : S. H. Guilford, Philadelphia, Pa., J. B. Willmott, Toronto (Canada), Theodore Menges, Chicago, Ill., L. M. Cowardin, Richmond, Va., and James Truman, Philadelphia, Pa., Committee on Text-books ; J. A. Follett, Boston, Mass., G. E. Hunt, Indianapolis, Ind., C. N. Peirce, Philadelphia, Pa., A. H. Fuller, St. Louis, Mo., and D. J. McMullen, Kansas City, Mo., Committee on Schools.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

EDITOR: A. W. HARLAN, M. D., D. D. S.

ASSOCIATE EDITORS:

THOS. E. WEEKS, D. D. S.

A. E. MOREY, PH. B., D. D. S.

THE AMERICAN DENTAL ASSOCIATION.

From the beginning of its existence until the present, the above association has been convened in the month of August, with one or two exceptions. By referring to the attendance for the past five years any one may see that, numerically, the meetings are not larger than they were ten or fifteen years ago. Why is this so?

In attempting to answer this question many things are to be taken into consideration. The first cause for nongrowth we believe to be in the iron clad rule that the association shall be convened in the first week in August. The second cause is the assembling of two or three other associations at the same time, composed for the most part of members of the A. D. A. In themselves these associations are not hinderers of its growth, but in consequence of close attention on the meetings of these bodies the members become fagged out, their minds are saturated with questions brought before the associations of faculties and examiners, and the technical society, and the dental protective association, and many leave for their homes before the end of the first or second days' session are closed or go elsewhere on their vacations. The meetings of these extra dental bodies detract also from the interest of the A. D. A. meetings, because many of the topics for discussion are discussed in these special meetings.

The third cause for nonattendance lies with the torpidity of the executive committee. If a meeting is well advertised three months before its convocation, the attendance is generally good—if it is not, it is poor. A change is needed in the management of the

work of "booming" a meeting. New blood is needed in the *personnel* of the committee and new methods could safely be borrowed from the vigorous way the committees of the B. D. A. or those of the National Dental Society of France work in this direction. The American Medical Association does not cease to keep itself before the medical public from the adjournment of one meeting until the assembling of the next.

A more frequent change should be made in the officering of sections, and the work should be done by the vote of the officers of the association instead of by the sections themselves. In this manner, although somewhat arbitrary, the best men would be selected from year to year, and new talent would be enlisted. We do not believe in the bringing of condensations of local society work before this body, as it is generally published before the meeting, and those who are members of the A. D. A. are supposed to be readers of current literature. Another thing that would enhance the value of a membership would be making it more difficult to enter. Let there be one delegate to every ten members of a local society and more would be anxious to attend the meetings. If the American Dental Association is to grow from year to year it will have to get a move on itself and invade new territory. We must meet in the west, the middle west, the south and the southeast. It will not do to rally around Niagara Falls, Saratoga, Old Point Comfort and between these points any longer. We think and we believe that it will do no harm to hold a few meetings in large cities, even if it be uncomfortable for a few. Something will have to be done to revive the interest and tear away the stumbling blocks to the future progress and welfare of the association. There are other hindrances to the steady growth of this body which we will refer to later on in the year.

ON SOME UNUSUAL FORMS OF ABSCESS.

Lately we have been brought face to face with some unusual cases of abscess, unusual because the teeth that were pulpless gave rise to but one fistula. One of these came from a central and lateral incisor and another from both centrals and a lateral. The difficulty of diagnosis was on account of the fact that the fistule seemed to proceed from only one tooth and there was no apparent reason for supposing that the pulps were dead in the adjacent teeth.

Even the electric light failed to prove that the pulps were dead. Recently a case that had passed through the hands of three competent dentists was presented, with an abscess from both roots of an inferior molar. After the roots were cleansed, sterilized and filled, the fistule—weeks afterward—had not closed. All of the root filling was removed and the treatment repeated, including the filling of the roots again but to no purpose. Upon testing the adjacent bicuspid the pulp was found dead and the fistule leading from it opened directly through the other opposite the molar. The point we wish to make is that frequently pulps in adjacent teeth are dead without any visible external sign to guide the examiner. In all such cases a careful test of the teeth is necessary to positively cure the fistule which may be opposite the root of a tooth previously treated. It is apparent that any one might make a mistake and drill out the bony tissue around the apex of a root on the supposition that caries or necrosis was present, when a little careful search would prove that the adjacent tooth being pulpless was the cause of a fistule not closing up after a reasonable lapse of time.

Abscesses are more or less troublesome—alveolar abscesses—and he who thinks that all of them remain in a state of perfect salubrity after treatment is liable to be mistaken ten or fifteen years later, after a single sure shot treatment has been practiced. Incomplete sterilization, and incomplete root filling are the barriers to success.

REVIEWS AND ABSTRACTS.

TRANSACTIONS OF THE AMERICAN DENTAL ASSOCIATION at the twenty-fifth annual session, held at Asbury Park, N. J., commencing August 6, 1895. Publication committee, GEO. H. CUSHING, E. T. DARBY, A. W. HARLAN. Philadelphia: The S. S. White Dental Manufacturing Company. 1896.

The meeting of 1895 has been so long a matter of history and its proceedings have been so fully recorded in the journals that any extended notice of the printed transactions may seem unnecessary. The volume now before us, however, contains so much of interest to the profession that it will not fail to be a source of inspiration and pleasure, even though received at so late a day. It

consists of 380 pages and is generously and beautifully illustrated. Two papers upon the subject of controlling the increase of dental colleges show the prevalence of the "protective" idea among us. Dr. Fillebrown made apparent in his remarks upon the question the futility of any attempts at restrictive legislation. Let fission, sporulation and spontaneous generation go on, for the inexorable law of supply and demand will furnish a certain solution to the problem. Close observers also agree that the multiplication of dentists has much to do with the education of people up to requiring dental services. The department store dental office, advertising parlors, as well as all other flagrant offenders of our code, must have no little influence for good in this direction.

The Committee on Terminology are doing excellent work in a direction which makes for greater accuracy in the diction and literature of a profession which is sadly handicapped by its lack of college bred men. The report showed marked ability, and its suggestions are almost beyond criticism.

An article on cataphoresis, by Dr. Gillett, puts him on record as one of the pioneers in producing cocaine anæsthesia of dentine by electrical osmosis.

The paper on compressed air escaped the censorship of a not over watchful chairman of the section. The association has no time to spare for such delusive lucubrations.

Drs. Abbott's and Cryer's exhibitions were most valuable and have already begun their educational work.

Dr. Brophy describes an operation for cleft palate in subjects where the temporary teeth have erupted, which is another of his surgical triumphs.

The book is a valuable addition to the series and reflects much credit upon the editor and publishers. J. W. W.

EXTRACTION OF THE TEETH. By J. F. COLYER, L. R. C. P., M. R. C. S., L. D. S., London. C. Ash & Sons. Cloth, price \$1, 1896.

Mr. Colyer has condensed into eighty pages about as much information on extracting as is needed by the students. Most of the illustrations are good. We doubt the propriety of giving directions for extraction of malposed incisors and cuspids as shown in cuts on pages 46, 47, 48 and 49. Such teeth do not need to be ex-

tracted. The book as a guide will be useful in countries where extraction of teeth is much practiced. In the United States fewer and fewer teeth are extracted annually, except as a result of hopeless disease, accident or malposition.

MEMORANDA.

Dr. Hohey, of Wellington, New Zealand, is visiting in Chicago.

A dentist is wanted at Mandan, North Dakota. Address the mayor of the city.

Dr. J. A. Truman has suggested the filling of roots with unvulcanized rubber and chloroform as the solvent.

Dr. B. F. Eshelman has removed to Tacoma and taken the professorship of prosthetic dentistry in the Tacoma Dental College.

Two bottles of pyrozone exploded in our office August 27, with a temperature of 70° Fahrenheit. One was 5 per cent and the other 25 per cent.

A new dental journal, *Welch's Dental Monthly*, is just out. It looks very much like the *Items of Interest*, and has the same flavor of the old one, color, dullness and all.

NORTHERN ILLINOIS DENTAL SOCIETY.

The Northern Illinois Dental Society will meet October 21-22, in Odd Fellows Hall, Elgin, Ill.

Cataphoresis—seems to me that I have heard that word before! but where? I have it—it was, it was—in a street car—or—a dental meeting—or in a newspaper—there that was it. (?).

The Odontographic Journal very much resembles the *International Dental Journal* nowadays, especially the color of the cover, type, etc. It is sprightlier and has more science in it than its neighbor.

According to the treasurer's circular only forty-six members of the Southern Dental Association have paid their dues to 1896. One, two and three stars are opposite most of the names. A* means not paid.

I have used loretin in a saturated solution with water in pyorrhœa pockets a few times. It certainly arrests pus formation, does not taste badly, has no particular odor, but is quite yellow, like pyoktanin does not stain permanently.

The efforts to procure patronage by the daily advertiser are not much appreciated by gentlemen of the cloth; as we have received several circulars which were to the effect that the clergymen respectfully declined to be classed as paupers.

Dr. W. W. Walker, of New York, has been the guest of several of our French confrères in Paris. We have received very elaborate *menu* cards with the names of those present at several of the dinners. Dr. D. N. McQuillen was a guest at some of these dinners also. We expect to arrive about 1900 for the congress of Paris. It is about time that the sub basement of the next fabric was laid. The congress ought to be a great success.

The pulps of teeth die under labial fillings quite often, especially in bicus-pids. These teeth do not change color perceptibly, but the safest plan of dealing with them is to open them up from the cutting edges, disinfect, and fill the roots.

STATE BOARD OF DENTAL EXAMINERS.

The annual meeting will be held in the State house September 25, 1896. Candidates for license must present themselves before 10 A. M. of that day.

L. L. DAVIS, *Secretary*,
103 State Street, Chicago.

WISCONSIN STATE DENTAL SOCIETY.

Dr. T. B. Fletcher, Portage, President; Dr. G. C. Kollock, Madison, First Vice President; Dr. O. C. Moon, Beaver Dam, Second Vice President; Dr. W. H. Carson, Milwaukee, Secretary; Dr. B. Douglas, Appleton, Treasurer; Dr. G. A. Sinclair, New Lisbon, Member Board of Examiners. Next meeting to be held in Madison.

Tremendous efforts are being made in New South Wales to pass a dental law. The outpourings of the earth are flocking to that land of promise in order to evade the responsibility of being qualified to practice. Dr. Alfred Burne, who was present at the World's Columbian Dental Congress, has sent us late papers from Sydney showing the dental bill has passed one house and is now in the other up for the second reading, with every prospect of success. Then there will be a dental school of course.

The Minnesota State Dental Association held its thirteenth annual meeting in Winona, August 19, 20 and 21. The following officers were elected: President, Dr. W. D. James Tracy; Vice President, Dr. F. S. Robinson, Plainview; Secretary, Dr. H. L. Cruttenden, Northfield; Treasurer, Dr. H. M. Reid, Minneapolis; Chairman Executive Committee; Dr. O. A. Weiss, Minneapolis; Master of Clinics, Dr. T. B. Hartzell, Minneapolis. The place of next meeting will be Minneapolis.

Very truly yours,

H. L. CRUTTENDEN, *Secretary*.

The California State Dental Association held its twenty-sixth annual meeting at Santa Cruz, June 9-12, inclusive.

This was the first time this association has held its meetings outside of San Francisco, and the attendance and interest was such as to induce a continuance of the plan. The next meeting will be held at San Jose, 1898, the meeting for 1897 being discontinued because of our Pacific Coast Dental Congress. The following officers were elected:

President, Dr. Russell H. Cool, Oakland; First Vice President, Dr. F. H. Metcalf, Sacramento; Second Vice President, Dr. Walter F. Lewis, Oakland; Third Vice President, Dr. L. Van Orden, San Francisco; Recording Secretary, Dr. W. Z. King, San Francisco; Corresponding Secretary, Dr. Frank C. Pague, San Francisco; Treasurer, Dr. Thomas Iglehart, San Francisco.

FRANK C. PAGUE, *Corresponding Secretary*,
819 Market Street, San Francisco.

DENTAL ASSOCIATION OF NEW SOUTH WALES.—ANNUAL MEETING.

The fourth annual meeting of the Dental Association of New South Wales was held at the hotel Australia last evening. Dr. A. Burne presided. The fourth annual report stated that despite the seeming inactivity of the council during the last year the chief object of the association had been pushed forward, with the result that the dental bill had been placed before the Upper House. Regret was expressed at the loss sustained by the death of Dr. Arthur Hinder on the 11th November last, who was for three years and three months a valued member of the council, and later on the late Hon. treasurer (Dr. W. Turner Halstead), who died the 5th May of the present year. The report was adopted. The balance sheet, which showed a capital account of £73.19s 10d, was also adopted. The following office bearers were elected: President, Dr. A. Burne; Vice Presidents, Messrs. H. Paterson and T. Chaim; Treasurer, Dr. Oscar Davis; Secretary, Mr. H. Taylor; Committee, Messrs. Marshall, Newton, Darton, Gabriel and Halloway; Auditors, Messrs. B. Corbett and A. G. Kibblewhite. A vote of thanks was passed to the Hon. W. J. Trickett for the interest that he had displayed in connection with the dental bill.—*Sydney paper*.

ABOUT COCAINE.

Following is a summary of an interesting paper on the "National Use of Cocaine in Surgery." (Dr. C. A. Dundore, *Medical and Surgical Reporter*):

1. The use of cocaine in surgery should not be abandoned because its irrational employment has produced deleterious results.
2. Always make a thorough physical examination of the patient before injecting the drug.
3. It should not be used in cases showing organic disease of the brain, heart, lungs, or kidneys, or in persons of a neurotic diathesis.
4. Children bear it fully as well as adults.
5. The patient should always be placed in a recumbent position prior to its employment.
6. Constriction should be used, whenever possible, to limit the action of the drug to the desired area.
7. Use a freshly prepared solution for each case.
8. Distilled water is to be employed, to which phenic, salicylic, or boric acid is to be added.
9. A 2 per cent solution has a better effect and is safer than stronger solutions.
10. Never inject a larger quantity than $1\frac{1}{8}$ grains when no constriction is used.
11. About the head, face and neck, one-third grain may never be exceeded.
12. When constriction is possible, the dose should be as large as 2 grains.
13. Every slight physiological effect is not necessarily to be taken as cause for alarm.
14. Cocaine *does* have effect on inflamed tissues.
15. In case alarming symptoms threaten, use amyl nitrite, strychnine, digitalis, ether, or ammonia.

THE DENTAL REVIEW.

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No. 10

ORIGINAL COMMUNICATIONS.

FACIAL DENTISTRY.*

BY C. S. CASE, D. D. S., M. D., CHICAGO, ILL.

What has the physiognomy to do with dentistry? What has it to say of the propriety of saving and extracting teeth? What has it to say to men who are so devoted to the noble and fascinating art of saving the natural teeth that in the contemplation of an operation, their visions are almost invariably narrowed to the confines of the oral cavity, and the possibilities of surgical and mechanical methods of restoring the members of the dental arches to health, contour and occlusion? What has the physiognomy to say to minds that are prone to take no cognizance whatever of a broader view or deeply study allied fields of equal imperative importance, which at times speak in no uncertain language, and whose silent appeal for help in this particular has come down from past ages to the modern dentist, who is the only being on earth, and so far as we know, the only being that has ever existed capable of responding to this appeal?

In that silent language which when understood is more expressive than written or spoken words, the physiognomy frequently appeals to us, and nearly as frequently appeals in vain. This appeal is not directed alone to the specialist in dental and facial orthopedia, but to the general practitioner who is truly devoted to the most scientific methods of his profession, and who seeks but to know the true way to most effectually relieve suffering and restore harmony within the scope of his ability.

This appeal is in relation to the saving and the extraction of

* Read before the Chicago Dental Society.

certain teeth during the age of immaturity which are destined to influence for better or for worse the shape and size of the dental arch and maxillæ, and in turn those features of the face that are dependent on the teeth and jaws for their contour.

Though the natural forces of heredity play a most important part, and the union of undiluted, inharmonious types be ineradicable in the selective breeding of human species, and finally, though it be an established fact that the development of the teeth and the alveolar process and the development of the jaws are two distinct and independent processes, there is much reason to believe, and many evidences in my practice prove that the development, growth, and eruption of large, crowded teeth in an immature jaw, especially that of the superior maxillary, will tend to increase its inherent size ; and on the other hand, the expedient extraction of certain teeth at the proper time from such an arch will remove this influence, and possibly reduce the inherent size of the maxilla.

At all events, if such a course were pursued by the entire dental profession, according to correct principles that would require but a slight broadening of our dental knowledge, there would be a decided diminution of the many abnormal dental and facial protrusions that we frequently see.

Again, with physiognomies that demand the completest natural growth of the maxillæ, if teeth were saved that are often extracted, their presence in the arch during the development of the jaw would tend to increase its size and thus prevent an imperfection of the features. Then if the desired fullness is not attained by natural processes the present possibilities of force appliances can sufficiently enlarge the dental, alveolar and often the maxillary arch commensurate with harmonious demands and facial effects. And what is of imperative importance in this particular, the presence of all these teeth as integral members of that arch is absolutely necessary at this time to retain the artificially developed jaw and facial contours in their corrected position.

Though there are many instances which seem to prove the fallacy of the theory that the inherit size of the maxillary bones are ever changed by natural forces introduced and operating independent of accidental and mechanical influences, there are innumerable instances to convince us that jaws and other bones are decidedly changed from their inherent shape and size by accidental causes, operating with slight but persistent force during the early years of

immaturity and growth. And I think I may say with equal assurance that many evidences besides those I have heretofore published, prove that artificial forces are capable of correcting certain inherent and acquired facial deformities that seemed to be wholly or in part due to an unsymmetrical conformation of the osseous frame beyond the area of the teeth and alveolar process.

Those who have given little thought to the facial phase of dentistry will underrate its importance and practical bearing, as compared to other things in a busy practice which demand their skill—such as the saving of the teeth principally for masticating purposes on the one hand, and on the other to the extraction of teeth that are difficult or impossible to save to be replaced by crown, bridge or plate dentures, and also the extraction of teeth that seem to produce an irregularity in the alignment of the dental arches; and yet in many instances where teeth have been saved and where teeth have been extracted, had the operator given less thought to profit and more to the silent appeal of the physiognomy the opposite practice would have been pursued to the incalculable benefit to the patient and the satisfaction to the operator.

The prevention or the correction of an inherent or accidental facial deformity is something more than the mere beautifying of the features for others to look upon. This is but a small part of the story. It exerts an incalculable force upon the psychological development of the mind, and influences the entire moulding of the individual character. Especially is this true of girls whose susceptible natures are sensitive to the slightest influences, producing deep and lasting impressions which exert a great influence upon the development of character and frequently change the circumstances, surroundings and possibilities of a whole life. Upon this branch of the subject alone there is food for a whole essay, the teachings of which every capable mind must fully appreciate and acknowledge without the requirement of further words from me.

The subject which I am attempting to bring before you is a large one. In its widest scope it includes the propriety of saving, and on the other hand, the propriety of extracting certain teeth of the deciduous as well as the permanent dental arches, which in any way influence the prevention, the production and the correction of dento-facial irregularities.

I could bring before you a large number of models to illustrate

a great variety of its branches which might be presented in detail with benefit and profit to the dental profession, for I find in this particular branch of our dental literature a great dearth of sound common sense teaching, and almost nothing upon the important correlation of the physiognomy and teeth. In the short time allotted to a paper I shall be able to take up but two phases of this subject.



FIG. 1.

The first is in regard to the saving or the extraction of the superior bicuspid for patients older than fourteen to correct a dental irregularity; and the second is in regard to the early extraction of the bicuspid to prevent an abnormal superior protrusion.

If a beginner in the practice of orthodontia should bring to you a model of a case of irregularity for advice, and this model—as frequently occurs in my experience—is that of the upper alone, and should happen to be similar to Fig. 1, you might proceed to study that model with a view of determining the easiest and surest method that would result in a perfect alignment of the dental arch; and possibly advise as a preliminary step, the extraction of the first bicuspid: a proceeding that would probably be correct so far as the upper teeth are concerned. Or if he had given you the articulated models of the upper and lower, as shown in Fig. 2, you might still adhere to your first opinion and advise the extraction also of the first inferior bicuspid, which would certainly be correct in this case if you extracted the superior bicuspid. Nor am I so sure that this would not be the course pursued by many, who are not adepts in the practice of orthodontia, even were they allowed to see the face of the patient, which we will suppose to be similar to the one who had this particular irregularity and as is shown by the face, model Fig. 3. It will be seen to be one of those peculiar physiognomies which produced the effect of a prognathus jaw. Certainly the extraction of

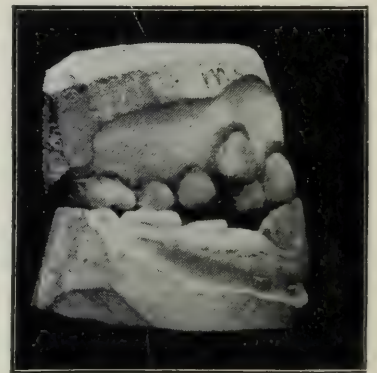


FIG. 2.

the first inferior bicuspid, which had just commenced to erupt, and the retraction of the anterior teeth would reduce the apparent protrusion of the lower lip and bring it into more perfect harmony with the depressed upper lip.



FIG. 3.

Yet when you come to study this face carefully from a higher standpoint of art and æsthetic development I think you will agree with me that the chin and lower lip is not protruded, in their relations to the malar prominences, bridge of the nose and forehead, but that the central features of the physiognomy are depressed even to a decided retraction of the lower portion of the nose, and that which is really demanded in this case is the

advancement or forward movement of the entire intermaxillary portion of the jaw and incisor teeth; and further every tooth in that dental arch is necessary for the ultimate retention of the several parts in their corrected position.

Fig. 4 shows the result of widening the arch and forcing the crowns of the incisors forward—the method that is commonly pursued in these cases when the bicuspid are not extracted. This has allowed the cuspids to take their positions but has left the teeth in a crowded and somewhat irregular condition and has produced no special facial improvement.

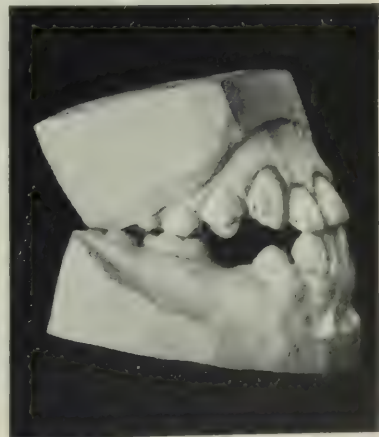


FIG. 4.

Fig. 5 shows correctly the final result, which was accomplished with the contouring apparatus that has been fully described elsewhere. It will be seen that the incisors are now in an upright position and there is now ample room for all the teeth, while the remarkable improvement to the physiognomy is poorly shown by the face model 6.

In this same line of practice I now ask you to examine the models of another case.

That of the upper arch (see Fig. 7), if examined alone and

compared to the upper of the former case, or Fig. 1, will be found very similar. The same crowded condition of the teeth, the same lack of sufficient room for the proper eruption of the cuspids; and

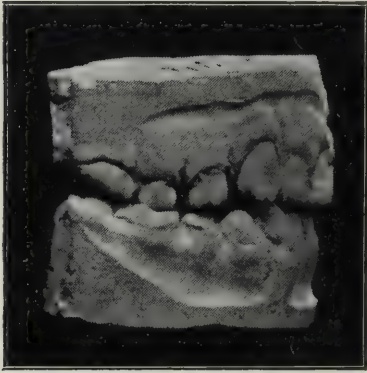


FIG. 5.



FIG. 6.

yet, as has been proven, this is from the model of a case that absolutely demanded the extraction of the bicuspid, as I shall show. The fact, however, that the regulation of the case was attempted without extraction, under the immediate advice and direction of one of the most prominent dentists of New York City must lead us to the conclusion that the physiognomy was either not consulted or did



FIG. 7.

not, at this time, exhibit to a marked degree its future tendency, and that the mistake is one that would have been made by a large majority of the dental profession—certainly by all who are constitutionally opposed to the extraction of sound teeth.

Fig. 8 shows articulated models of the teeth when treatment was commenced by him at about fourteen years of age. Fig. 9 shows articulated models of the teeth about two years later, when the case was referred to me, after having been regulated.

It will be seen that the incisors have been forced forward to a decided labial inclination for the purpose of crowding the cuspids into alignment; and all the anterior teeth are turned on their axes so as to occupy the least possible space.

Here alone is a lesson that is worthy the profoundest thought of every dentist who attempts the regulation of teeth, or the treatment of teeth that are in a similar position.

The conical shape of the teeth even in a crowded dental arch, and while standing in perfect alignment, permits a decided outward flare of the occlusal zone. But always in proportion to this inclination, the interproximate space is closed, and, as in this instance, the cervices may be crowded so close together that between some of the teeth the union of the labial and lingual portions of the gum are completely severed.



FIG. 8.

It is not necessary for me to remind dentists in this age of the very great importance of preserving the interproximate spaces.

But why not enlarge the apical zone of the dental arch as was accomplished in the former case and perfect the regulation without extraction?

Because the features of the physiognomy that are supported



FIG. 9.



FIG. 10

by the maxillary arch are already sufficiently prominent. (See Fig. 10.)

The prime cause of this and similar dento-facial irregularities is the inheritance of teeth that are too large for a harmonious max-

illa. And in this instance it is partly due to the attempt to force all these teeth into alignment. By the simple extraction of the first bicuspid the difficulties in this case would have been nil

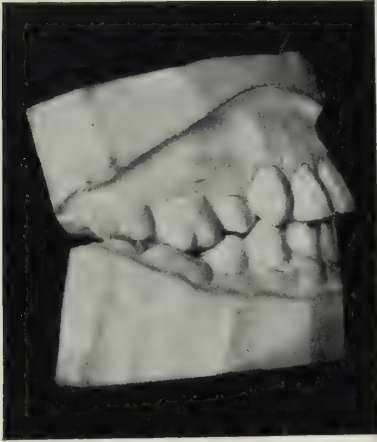


FIG. 11.



FIG. 12.

and the dental and facial faults soon remedied ; in fact, had the first superior bicuspid been extracted as soon as they erupted, together with the deciduous cuspids, I doubt if the case would have required other treatment. Figs. 11 and 12 show the result of treatment after the final extraction of the bicuspid.

Now let me call your attention to instances where the early extraction of the bicuspid, as soon as they can be reached with the forceps are equally demanded.

We frequently see adult faces with abnormal protruding upper jaws and teeth, and with a bulged appearance about the lower portion of the nose. The teeth are commonly large, prominent and crowded, though not always labially inclined. The alveolar arch is necessarily prominent, but the deformity in the main is due to the large size of the superior maxillary proper, far out of proportion to the more delicately chiseled features which it supports and forces into unsymmetrical contours. The depressions in which the wings of the nose rest are more or less obliterated, as would be occasioned by the sting of a bee or an alveolar abscess. The nostrils are broad and open, and the end of the nose forced forward and up (*retroussé*) by the protrusion of the spinous process and cartilaginous septum. The upper lip being stretched over its inharmonious frame is shortened so as to cover

the teeth with difficulty, and in action readily raises to an unpleasant exposure of the teeth and gums.

I have described an extreme though not uncommon condition. Every stage from this to perfect harmony characterizes the innumerable varieties of a certain type of physiognomies.

The important consideration for us, from an artistic and surgical standpoint is, has not nature been forced to produce this condition, wholly or in part, to accommodate teeth that were too large for the natural or inherent frame and overlying features? And can we have helped nature in the early years of development, by making it unnecessary for her to produce this excessive growth of bone for the development and sustenance of all these large teeth?

We certainly cannot reduce the size of the teeth, but we can reduce their number and in so doing reduce the size of the destined maxillary and dental arches.

But we must make no mistake. The danger of advocating such a principle to students and those who have given this branch of dentistry little thought is that teeth will be extracted to accommodate an overcrowded condition in the arch, with little or no thought of the physiognomy. When in reality a careful and properly pursued study of the features and their comparison with parental types will show that the dento-maxillary arch should be enlarged and every tooth remain to induce its natural growth and development. If this is not attained by natural processes, every tooth should certainly remain to hold the artificially developed arch in place as exemplified by the first case which I presented.

How are we to study the undeveloped face of a child, every lineament of which is passing through rapid changes of growth, with a view of determining whether or not the dental arch and jaws will be too prominent, or that other features will not enlarge to a harmonizing proportion?

A most wonderful provision of nature in dentition causes the full sized crowns of teeth to erupt, as regards time, somewhat in proportion to the natural growth and enlargement of the jaws. And even when they do not erupt earlier than is common, or when their natural eruption is not interfered with by the premature extraction of the deciduous teeth they are commonly obliged to take an irregular position or attitude, at first, and await the growth of the jaw which permits them to become regular.

Never extract a permanent tooth for the purpose alone of cor-

recting a dental irregularity, unless you know that the jaw has ceased growing, and never then unless you are convinced by a careful study of the position of the teeth—their relation and occlusion—that the dental arch should not be expanded, or by a study of the physiognomy, that the alveolo-dental arch should not be enlarged.

In a study of the relations of the teeth, the jaws and the physiognomy of a child with the view of determining the advisability of extraction to correct or prevent the ultimate production of a facial deformity or marked imperfection of the features, it may become necessary for you to see both parents and possibly other members of the family, to correctly determine the influences of inheritance.

In this comparison of temperament, physical frame, features and teeth, it may require no more than a glance to furnish you with all the data that will be of practical use. It would certainly be bad form to make an ostentatious display of the necessities of this proceeding, such as insisting that both parents come with the child that you may array, compare and note with pencil and paper, and with great pretense of knowledge and skill, the physical imperfections that have been propagated from one or the other, and that portend probable difficulties in the contemplated operation.

Such a course is neither in keeping with that modesty that ever characterizes true scientific methods, nor the common honesty of your profession.

When you have learned the routine of its requirements, this mental noting and comparing of data that may be useful to you, requires no more special skill than many other things in dentistry.

Usually only one parent comes with the little patient, and here you may find all that you require. If not, it will not be difficult to see and converse with other members of the family.

If there is a marked difference in the parents it may not be difficult to determine from which one the child has inherited the teeth, by the peculiar shape and size of the incisors alone. But in regard to the maxillæ in an undeveloped condition there will be more difficulty, though it will be well to remember that the deciduous teeth are rarely irregular or disproportionate in size to the frame and facial features. If, therefore, there is a more than natural difference in the size of the permanent and deciduous teeth it will indicate an inherent union of inharmonious types.

In this connection it must not be forgotten that the crowns of the permanent incisors are almost invariably far too large for their undeveloped surroundings. Mothers are frequently horrified and for some time lament the apparent abnormality in the size of the superior centrals.

If the occlusion of the incisor teeth are far from a normal type in their anterior relations, and the same condition exists with either parent, you may reasonably expect that you have before you the adult type of what the child will become if unaided by your skill. And especially if you find by comparison that there is a similarity in other particulars.

With differences in temperament compare general shape and size of the eyes, brows, ears and teeth.

Other features are so subject to change in the processes of natural growth and development they cannot be relied upon to furnish legitimate data. For instance, I have seen the nose change in a few years of late youthful development from one that was small and short, and, over the nasal bones decidedly depressed, to one that was diametrically different in every particular.

When you do not find in either parent the same unsymmetrical relations that promise to prevail in the child, see if the cause is not from a union of the large teeth of one parent with the small jaws of the other.

As I said before if the teeth of the parents are decidedly dissimilar in size, you may be able to determine with certainty, to which parent the teeth of the child are due, and if the teeth and jaws of the other parent are small and other features are similar to those of the child, you will be confirmed in your conclusion of the admixture of undiluted types.

All these things which have taken so long to describe and which may often be determined at a glance are of the utmost importance in determining the propriety of extracting certain teeth to reduce an apparent abnormal protrusion which may in time become symmetrical in its relation, by the natural growth of the jaws and other features; and on the other hand the equally culpable error of saving teeth, or the failure to extract teeth, whose very presence in the arch obliges nature to reproduce a parental deformity, or produce an acquired deformity, by an effort to sustain the large teeth of one parent in conjunction with the small jaws of the other.

For a child with an abnormal superior protrusion and with teeth prominent and crowded in an arch whose shape does not admit of correcting by a lateral expansion, extract the first bicuspid as early as possible and even before they have completed their eruption; together with the deciduous cuspids; unless it be one of those very rare instances where the first permanent molars cannot be saved.

The same is true of the lower, when there is reason to believe there will be a disproportionate overdevelopment of the lower dental arch.

In the ordinary course of eruption the development and eruption of the permanent cuspids are doubtless more influential than



FIG. 13.



FIG. 14.

other teeth in emphasizing an anterior protrusion of the central features of the physiognomy. In the course of their eruption they are obliged to crowd into alignment along the mesial surfaces of the roots and crowns of the first bicuspid—which at this time represent the immovable bases of the arch—with the result that the incisive and intermaxillary portion of the arch is forced forward to a more pronounced position. This movement has been shown to be not impossible or difficult of attainment even much later in life.

With the first bicuspid and deciduous cuspids removed sufficiently early, I believe there are numberless instances when the arch, anterior to the second bicuspid, would be diminished the width of a bicuspid, without resort to artificial means.

By the exertion of a slight traction force from an occipital base

of anchorage the sockets of the temporary cuspids will be closed by the permanent laterals, and the permanent cuspids in the course of their eruption will be deflected into the alveolus of the extracted bicuspid.

Figs. 13 and 14 represent one of many cases I am treating in this way, though not all by the occipital method.

Fig. 15 shows present position of teeth after about two months of traction force from molar anchorages. The protrusion was not so pronounced but that I believed I could obtain sufficient retraction of the arch by this method, and especially because I shall gain something by its lateral expansion.



FIG. 15.

The patient, nine years of age, was brought to me by his father. His mother I did not see till after the commencement of treatment. But I believed this to be unnecessary, because I found that the boy had the teeth, eyes, ears and general temperament of the father whose upper arch was abnormally protruded in a similar manner. In fact one of the reasons the



FIG. 16.



FIG. 17.

father gave for bringing him thus early, was that he "did not want him to grow up with teeth like his."

Had I found the father's teeth in proper relative and sym-

metrical position, and in other particulars that can be legitimately used as data, similar to those of the son's, it would have been an argument in favor of nonextraction with the expectation of other treatment later ; but it should not have been passed without seeing the mother. Had the mother's teeth been found small and the general physical features cast in a more delicate mould than her husband's, I should have pursued my investigations along other lines that require a closer discrimination, with the view of determining if the child had not the large teeth of the father and small jaws of the mother ; in which case extraction would also have been indicated.

Face models 16 and 17 are types of this character of facial deformity which I am treating and have under advisement. I shall be pleased to have you examine the articulated models of the teeth of these patients, and other cases, the face models of which I am unable to show.

WILL POWER, MIND AND NERVOUS SYSTEM IN THE ADMINISTRATION
OF ANÆSTHETICS.

BY NEY CHURCHMAN, D. D. S., PORTLAND, OREGON.

The subject matter of this paper will theorize upon the condition and preparation of the mind of the patient, and through it the control of the body and nervous system of the patient to be anæsthetized; and will consider only chloroform, ether and its combinations. Nitrous oxide and the subcutaneous injections of cocaine, its salts and preparations, you are familiar with. While I advance my views as theories, I shall endeavor to enlarge upon them in the course of this paper to the degree assumed by practical and demonstrated facts, hoping you shall find some food for thought and speculation, if not for practical use.

What few authorities I have examined upon this subject shall have honest and generous credit for any ideas taken from them or incorporated in the subject matter of this paper.

In the contemplation of a subject upon which to base a paper that shall prove the least instructive, it would seem as though even the North Pole of discoveries in theory or practice or subject matter had been attained and discussed to a weary length. The subject I have chosen is not anæsthetics or their symbols and formulas, in a general way with which you are all familiar, but the preliminary preparation of the mind of the patient for the administration of ether, chloroform and its mixtures.

The emotional system participates in the general mental disturbance, and is often a part of the mind deranged. The fixing the attention of the mind upon the body is, of course, apt to develop symptoms which would otherwise never make their appearance.

Medical men are liable to be affected with diseases to which they have given special attention, say Fisher and McDonald, page 98, in their pages upon anæsthetics. So patients have died from fear, or from want of that preparation of the mind, the nervous system, and from it the control of the heart's action and the functions of life, which leave them in a state quickly recuperative; which neglected, result fatally to an otherwise proper subject for the anæsthetic state.

Witness the death of Elliott F. Shepard, proprietor of the *New York Mail and Express*, a perfectly healthy subject (as a

post-mortem determined) dying under the effect of chloroform or ether administered by two of the ablest surgeons in New York City, while no fault could attach to the surgeons. He was a man of active brain and sensitive nature, whose mind was probably in a state indicating anything but favorable for giving an anæsthetic, could the secret apprehension of his mind and heart be known and dispelled by a little harmless deception. Many patients unfamiliar with the odor or effect of ether or chloroform are led to believe by words or gesture that the time has come to make a will, or the chances are to be taken in never coming to life again. I have seen a patient etherized in this city before whose disappearing vision was an array of instruments, bowls and sponges and white aproned operatives which possibly would occasion a shock however slight, to the nervous system, sufficient to waft the soul of the patient over the knife edge line dividing the *here* and *there*.

The recession of the senses deserve some attention in the giving of an anæsthetic. The hearing in most subjects being the last one retained, it can be dwelt upon better in the preliminary leading up to the administration of the anæsthetic. It will be necessary in the way of illustrating the theory I have advanced to cite some cases that have come within my observation. Cases in history are authentic where the mind in its distortion controlled the body to produce death or the different symptoms or stages leading up to it. Witness the French prisoner who, by the aid of bandages and trickling warm water and other deceptions, believed he was being bled to death, and died from the belief. I have dropped ice water upon the naked backs of steamship firemen, working in front of leaky boilers, who firmly believed they were scalded until convinced otherwise; so by these illustrations I wish in showing the control of the mind over the body, that a patient's life may depend upon the hope he derives from the deception practiced upon him as to the real danger he is about to undergo or the nature of the anæsthetic to be inhaled.

I believe the mind of most patients can be concentrated upon one subject of thought by the sense of smell as well as hearing. To a person unfamiliar with the odor of chloroform or ether I have used a strong and pleasant perfume, gradually substituting the anæsthetic accompanying some deceptive explanation. From a record kept, nine out of ten patients so anæsthetized, the sensations were of beautiful gardens, intoxicating odors and pleasant sensa-

tions. I have relied in many cases upon the sense of hearing, explaining to the patient that concentration of mind and thought, and obedience to my commands render the operation short, safe and pleasant.

The first instruction upon beginning the administration is to breathe naturally and upon my command; to take a long deep breath and then resume the natural respiration again. The patient, if obedient, has his mind so occupied with the instructions and obeying them, to the exclusion of any other thought, that I have seen numerous patients when commanded to take a long, deep breath, make the effort when almost completely anæsthetized, showing how the mind was concentrated upon the instruction given. Right here I believe, in most cases, is the primary anæsthetic state for short operations. I shall cite a couple of cases in support of the theory.

First case. Male, æt. forty-five; nervous temperament. Had teeth extracted upon two occasions some ten years apart. It required three to four men to hold him and operate; an office wrecker, if any of you gentlemen have met such. He dreaded the operation and warned me against attempting it single handed. I informed him I had a new anæsthetic, which depended for its success, upon strict attention to my instructions. Concentrated his mind upon his hearing and gave him A. C. E. without a struggle on his part.

The next case, a resident of Mount Tabor. Heavy, muscular man, about forty; sanguino-bilious temperament. Had wrecked one dental office and one surgeon's office partly demolished for a record. Administered an anæsthetic upon two occasions and extracted some very hard teeth, and while afraid of him, never had any trouble. His explanations of his quietness was that he had no sense of fear while in my hands and perfect confidence in the successful termination of the operation.

I have demonstrated, what may seem to you gentlemen of the profession as mere theory so often, that I have come to believe that more depends upon the one who administers the anæsthetic, his manner, magnetism, his touch, influence over the patient, etc., than upon the deft fingers of the operative surgeons in capital operations; and when surgeons in active practice have stated to me that they have not given an anæsthetic in years, I am led to believe that the specialist in the giving of anæsthetics, will be recognized

as the most important attendant in all operations requiring the use of the same; and as the submarine diver dons his harness and swings off the ladder in the depths below, having confidence in the men at the air pumps, that they are steady and careful, free from the influence of stimulants and will faithfully furnish him with the life-giving air that will land him on earth again alive. So in the administration of anæsthetics let the patient take his dive into that realm of unconsciousness separated by the thinnest kind of portieres from the great beyond, with that full and perfect confidence in the man at the sponge, which is instilled by his manner, addresses, sympathetic nature and a number of little attentions to details that leave the brain of the patient and nerve system dependent, in that state that is in full accord with the successful termination of the operation.

HYGIENE.*

BY T. E. POWELL, D. D. S., CHICAGO, ILL.

There are few vocations which try the endurance of man, physically speaking, to a greater degree than the practice of dentistry. The dentist is closely confined to the office during that part of the day which could be most beneficially and pleasantly spent in the open air. Not only is he confined to the office during this period of sunshine, but his mind is intensely occupied with difficulties which require his earnest and most painstaking efforts to overcome. The concentration necessary to the satisfactory execution of gold fillings, crown and bridge work, etc., etc., would seem to exhaust the nervous force of a robust man; but in addition to this, the dentist must soothe nervous and frequently hysterical women, and manage children who have been prepared beforehand by tales of pain inflicted which are equalled only by tortures conjured in the minds of North American Indians of two hundred years ago.

Having worked all day under such trying conditions, how many men are fit for anything except the bed when night finally does come?

Not long ago a lady came into my office and said she had always gone to a certain very busy dentist, but he had become so

*Read before Hayden Dental Society, September 21, 1896.

cross that she could not stand it any longer. Said she: "He is so irritable, I don't see how any one can endure his bad temper."

Notwithstanding the constant strain on our nerves and the positive certainty of either an early grave, or permanently impaired health, we drive along, day after day with little or no effort to counteract the effects of overwork by pleasant and healthful recreations, or any consistent observance of the laws of hygiene.

Webster defines hygiene as "a system of principles or rules designed for the promotion of health;" also, "that department of sanitary science which treats of the preservation of health."

In this paper, I shall endeavor to offer some suggestions which will, I believe, if followed by members of our profession, do much toward the maintenance of a perfect mental and physical equilibrium.

Let the first consideration always be that of good ventilation. Be sure that there is plenty of fresh air in the room all of the time. There should be no direct currents or draughts. The windows ought to be so adjusted that the air may enter and circulate without disturbing any light substance in the room.

In order to accomplish this the windows must be opened from the bottom and a guard placed in front of the open space, so as to direct the air toward the upper part of the room.

Even in the coldest weather this may be done without any discomfort, provided the room be properly heated, and the heat should always be regulated with a view to proper ventilation.

A thermometer is indispensable if perfect ventilation and a normal temperature are desired. Nothing has a more depressing effect, or causes such a marked irritation of the nervous system, as an overheated, poorly ventilated room.

In reference to work at the chair, one should try to keep an erect position. If any one must assume an unnatural position, let it be the patient.

Manipulate the chair instead of the spinal column. Learn to work with the glass instead of crouching as if about to spring upon your prey. Avoid the patient's breath if possible. The adjustment of the rubber dam mitigates this evil. Do not hurry; do not worry; but do your work calmly and deliberately. Allow your patient's excitability to increase your imperturbability. Nothing will deepen the furrows in one's face or bring on physical wreck more quickly than fretting or worrying. Do not give appointments

for trying operations during the later hours of the day, when you are all tired out, but try to arrange to have the easiest work come during the last two hours.

Use an antiseptic solution on your hands after washing them, as it is not safe to depend on soap and water. It has been thoroughly demonstrated that soap and water will not remove diseased germs from the hands, however carefully you may wash them. How frequently operators may be seen using their teeth as a receptacle for instruments while operating. Such instruments, for instance as the mouth mirror, gold pluggers, foil carriers, etc.

The danger of this practice is apparent. We are too careless.

Carelessness frequently costs a man his life. Let us watch these points. Good men are scarce.

There are many other things I might suggest in this connection, but the length of this paper will not permit.

I want to speak of some things we should do outside of the office.

Some do observe religiously many of the points mentioned above, but make no effort whatever to keep the body in perfect health by using, outside of the office, some of the numerous means by which the health may be maintained.

There is such a diversity of ways by which we may gain the necessary amount of recreation, that it is useless for me to particularize. My aim is to emphasize the necessity for this recreation, rather than the manner in which it is obtained.

Every animal requires a certain amount of sunshine and fresh air, and man is no exception to the general rule. There is no reasonable excuse for the neglect of this side of one's nature, when any one can have for a mere pittance, a trolley ride or a walk in the park free gratis. If neither of these suits, there is horseback, carriage, or bicycle riding, ball, tennis or croquet playing. These and the many additional diversions which the ingenuity of man has furnished, would seem to provide means by which an earnest seeker for health may be gratified.

When we have done with the physical, much remains yet to be attained. The mental nature, like the physical, must have a diversified field of activity in order to have that roundness of form and elasticity of fiber, which is so much admired and desired. The desire to become a mental gymnast is father to its accomplishment.

We must not, of course, neglect our own field of literature;

but the truly ambitious mind will not be satisfied with this. Scientific and secular literature can be obtained in such abundance at prices within the reach of all, that he who hungers may be filled. There are the daily papers which give us all of the current news of political, business and social life; and the magazines which teem with articles more or less patent to every walk in life; articles, some of which are learned and intellectual enough to please the most profound; others, which the most superficial reader may characterize as verbose. But the rule for the busy man should be to use that which will give the most pleasure and at the same time yield the largest amount of instruction. It should ever be our aim to improve the mind, and to do this much judgment is required in the choice of reading matter. The study of scientific matter probably gives a better return for the amount of time expended than the study of either art or literature, and it has the additional advantage of being particularly helpful to us in our special work.

In closing, I desire to speak of moral hygiene, so much neglected and yet so indispensable to the fully rounded, thoroughly reliable professional man. We cannot stand still in any part of our natures; we must progress or retrograde, and it will surely be the latter unless an effort be made toward the former. No man can do his best unless the spiritual nature which dominates all the rest is in perfect health. This condition of moral health may be preserved without allying one's self with a religious organization, but it cannot be either acquired or maintained without a constant effort. A system of principles or rules which will best promote this ideal condition must be formulated by each one for himself. No set of ready made rules will answer the purpose. The public expects us to be above reproach, and unless the interior is clean, the exterior must, sooner or later, give evidence of the true state of things.

I have tried in the paper to show what hygiene means as applied to dentistry as viewed from my standpoint. Much more might profitably be said, but if I have awakened sufficient interest to provoke a lively discussion, I shall feel amply repaid for my trouble.

DENTAL JOURNALISM FROM A LAYMAN'S STANDPOINT.*

BY W. GIRLING, D. D. S., CHICAGO, ILL.

In the consideration of this subject we must all come under the head of laity and with knowledge and discrimination be fair in discerning what is the good and true value to be derived from our literature. Out of twenty dental journals published in the United States three only profess to confine themselves to original production. The others are made up from what they can beg, borrow or steal, and being the organ of some dental supply house are published to advertise their goods, together with enough reading matter to allow them to come under the head of dental journals. Criticism need not always be destructive but the eagerness to do something to attract attention, to be in print with one's wares that they may suit the public taste rather than to cultivate and elevate the standard of the profession, is an error that we often are blind to. Out of the abundance only a few can talk and fewer can write. When the robust critic perches upon the unsophisticated it creates within the mind of the promising young talent the determination, in the future, "to holler down his own rain barrel," and thus closes the source of an inspiration that, could it have received the just appreciation, would have encouraged the young idea to more careful thought and expression. It is comparatively easy for any one to appear in literature over their own signature, but to have something to say and have said it when said, requires the gift of expression that few are able to give. The genius can show you how to do a thing but he is loath to accept your invitation to write an exhaustive treatise explaining his peculiar "modus operandi" to appear in your journal. Then there are others to whom it is second nature to create an article and for whose names and writings we eagerly scan the pages of our journals as they come to us. The savory taste and pleasing atmosphere left to us after having finished an original production in any of our current literature, penned by a hand that left no doubt in our minds as to the future ability and usefulness of that person, creates for the good and higher standard of our profession, making one notch higher the emblem that floats over our calling and to which the best energies of our best men are being put forth to raise it above the foremost of professions.

*Read before the Odontographic Society of Chicago.

It is embarrassing indeed to begin a paper with apologies and yet the more thought one gives to this subject the less able is he to give anything like a fair knowledge of "dental journalism from a layman's standpoint." If from any reason more than another from the mere fact that one's knowledge can only come from those journals that he comes in contact with regularly, which from necessity may be limited in number, together with the realization that he may not have grown gray headed in the ranks as yet.

There is such a wide and varied assortment of journals that come under the head of dental journals that to undertake to form any very concise judgment as to how they appeal to one's likes, dislikes or demands would necessitate details beyond the point of endurance.

During the general conversation of the evening the subject of magazines is broached, and you hear one express himself as liking such a monthly magazine because it has more current reading, by better and more popular authors, while another prefers the ten cent magazine because it has such pretty pictures of actresses. Still another is very pronounced in offering up his opinion in favor of the five cent little periodical because of its catchy, racy, short stories. We all appreciate the needs of our brethren, and are always glad to listen to any suggestions, and so, during the preparation of this paper, in my diligent or otherwise endeavors to gather material and information, I chanced to be sitting at lunch a short time since, in a minor capacity, and as the pie was being quartered into three halves and distributed, the question was asked my neighbor on my right, "Doctor, what do you think of our literature?" He grinned, and replying, said: "It's all right, I guess, for all I know; I haven't time to read it very much." Later on, entering the office of this friend, he showed me a pile of journals several feet high that had been left just as they were received from the mail, the wrappers still on, and yet this gentleman is a contributor whose writings are eagerly sought after and read.

Again the question was propounded to a friend who had more hair on his head: "Doctor, what is your opinion of, and how do you read your journals?" A pleasant smile trickled across his face and hid itself under his brow as the wrinkles gathered in deep furrows of thought. Finally he replied in words like these: "I probably have a chance to see more journals than many of you, and am compelled to take in at a glance the general tone of the contributions, while I scan the contents for some particular article

or line of thought that has occupied my attention before, and in which I am interested." Another volunteered the information that he always began at the back part of the journal and read the advertisements first. I presume he is not far away from the majority in this act, and so the reading of certain dental journals by certain members of the profession, exacts of that journal a certain elevation, constantly demanding that nothing but that which every dentist, as a member of a scientific profession, ought to know and be interested in—nothing which is not comprehensible to any man fit to practice dentistry.

Of course the profession, as the world, is moved by the average man, and yet it were better that the average journal should shoot over the head of the average practitioner, for, as has been said, if he is fit to practice dentistry, he will bestir himself to greater accomplishments, and by using every means possible at hand, place himself just a little in advance of his fellows.

The regard for our dental journals is merely a matter of opinion. Frequently we run amuck a bank of production that it would seem good could a mowing machine pass over the whole field, and then again the tide comes back, and at its flood we find ourselves overwhelmed with the brilliancy from our profession, and we read and read again these products, which to us contain the character, quality, flavor and science that will go into history and make our literature. It has been suggested that much good could be derived from a quarterly or semiannual digest publication—one that *was* a digest and would give the pith of special investigations and research gleaned from regular monthly journals. The lengthy reports of the proceedings of societies continued from month to month would be condensed, and if the paper and discussion were properly assimilated, there is no doubt the reception of such a journal would be gratefully received. However, what would seem to come nearer the needs of the profession would be a weekly periodical, not too lengthy nor filled with prosy editorials, the horizon of which is bound to be limited, but a pamphlet to contain the records and best efforts of dental proceedings, as far-reaching as possible, containing original productions only. This, in my mind, would solve a problem, and give to the busy dentist a steady diet in small doses. We appreciate the fact that such an undertaking would entail the undivided attention of the editor to keep such a publication abreast of the profession, but other lines in other professions support such publications. Why not ours?

DENTAL CARIES, ITS ETIOLOGY AND PREVENTION.*

By E. S. CHISHOLM, D. D. S., ST. LOUIS, MO.

We offer no apology for writing upon the old, old theme dental decay, its etiology and prevention.

A great portion of our professional life is expended in waging war upon the subtle disease, dental caries, and without some understanding of its cause and prognosis, we can do but little toward arresting or preventing it. We are aware that this disease has been regarded by many able thinkers as pronounced in its characteristics as that of typhoid fever and other diseases of the human system, and can be as accurately differentiated. To this we make no issue, but endorse most fully, if the subject be ruled under the proper stipulations.

After over thirty years' warfare against decay, and scrutinizing its every phase, also closely watching the trend of the dental profession as it has chased the ignis fatuus of theoretical fancies, and each in turn dubbed with the misnomer title, "scientific," we come to the conclusion that a better idea of what science is should be gained. Science is the aggregate of only demonstrated fact, and as such these theories not demonstrated do not meet the requirements.

Again the settling of the issue as to the cause of dental caries is of greater import to us than one would at first think, since it is the foundation underlying every operation of the teeth, looking to their restoration and preservation, whether of crowning, filling, filing, bridging, etc.

You are aware of the many theories regarding the exciting causes of this disease, and that the advocates of each are not without some ground for predicating a theory. Time will not admit an attempt at even a short review of these, for they are all at your command, and within your text-books. The chemical, vital, chemico-vital, inflammatory, galvanic and microörganic and many others have each their advocates and have been largely discussed through the last half century.

Gentlemen, have you ever thought of soap-making, as irrelevant as it may seem to our subject?

Bones are boiled in strong lye to remove the animal or organic material which part of the bone is utilized in soap-making, thus

*Read before the St. Louis Dental Society.

ridding the bone of this one quality, organic matter. Another way of disposing of the organic portion is to burn it out. In either event the bone will remain a shapely mass of (mainly) phosphate of lime, very brittle and will easily crumble.

On the other hand, if a bone be immersed in a solution consisting of one part of hydrochloric acid to sixteen parts of water, the inorganic matter will be dissolved out and the animal or organic portion will be left in a bone shape. A fibula may become so flexible as to tie into a knot. Bone, therefore, is composed of two materials, organic and inorganic. The first may be consumed by alkalies, the other by acids. Other acids than hydrochloric produce like results, whether mineral or vegetable.

The human teeth are alike susceptible to the same chemical laws of destruction as that of bone, the rapidity of this process depending upon the density or porosity of the tissues. We must not forget, too, that acids and alkalies have a great love-on-first-sight affinity for each other, or else they are fearfully belligerent; for once in contact, they both lose their individuality, whether of love or war, and their power to destroy both bone and tooth are like our hero—

" Jack Spratt who could eat no fat,
And his wife could eat no lean,
But somehow betwixt the two
They licked the platter clean."

And what of tooth and bone, acid will not destroy, the alkali will, like Spratt and wife.

We give this brief statement of chemical facts as a probable predicate for seeking the cause of dental decay, believing as we do that these phenomena are due to chemical action, and mainly to acid reaction, upon the lime salts. Nor in the long list of arguments opposing this conclusion have we been able to find one which cannot satisfactorily be accounted for without violence to the chemical theory. In viewing the discussions on this subject I find only two reasons given strong enough to justify answering. The first is that all effort to produce decay by artificial means resembling in characteristics that of the natural mouth, have failed.

To this argument will say that no artificial means will ever establish the environments leading to this phenomenon. For one example alone, we will presume the proximal decay of a molar, because of V-shape space between it and its fellow; irregular sur-

face of enamel as it joins the cervix at the margin; natural predisposition, due to porosity. Such a space becomes the retaining point for foreign accumulations, and particularly fibrous foods, such as meats. The meshes of this substance here fixed being sponge-like, will collect all foods, both acids and sweets, or those containing starch, so easily converted into sugar, and at a temperature of $98\frac{1}{2}^{\circ}$ F., are soon fermented. The surface once roughened by the fermenting agents, it becomes greatly increased in power to retain foreign elements of destruction. Meantime, the entire mouth may be bathed in secretions probably alkaline rather than acid. Other surfaces, not roughened and predisposed, may have no cause whatever for disintegration. In fact, it would be impossible to place a tooth in conditions with environments exactly similar to those of the natural mouth. Temperature, proximity to other teeth, predisposition to decay, the nature of the secretions of the mouth, the quality of food eaten, the antagonistic relation to teeth in opposite jaw, the duration of time to produce the varied orders of decay.

The second objection to the acid theory is that if acids be the cause, all surfaces will alike be affected. The answer to the first answers as well the second, for we have seen how acids can remain in meshes of fibrous food between the teeth, and in irregularities and asperities, without being generally diffused throughout the whole mouth, and yet bathed in alkaline secretions.

But the question naturally arises, Whence come these acids, and what kinds are they? We answer that most all forms of acids are detrimental to the teeth, whether mineral or vegetable.

The ropy mucus secretion which lingers so tenaciously around and between the teeth of children and young mothers augments the susceptibility to decay, as it is often acid and vitiated. The use of an engine bur or polishing instrument, revolving rapidly, will roll upon the mandrel this tenacious mucus, and this feature marks a peculiar liability of decay.

As regards the microörganic theory which has elicited so much attention the last few years we would pay most deferential regards, for we know of no department of science that has made such rapid advance in the accounting for the many diseases and their rapid transmission; yet if all had been true regarding the liability of our being infected from the many germs in and around us, and in our food and upon all things we handle the whole human race would all have been dead long ago.

Nor have we been able to find any well-grounded argument sustaining the belief that the limesalts of the enamel, or even the dentine, can be broken down by any forms of germs. But the acids which linger in retentive pockets of decay is the indigenous habitat of microörganic germs. The gay and festive *leptothrix buccalis* of Rottenstein and Leber has not been accredited with ability to perform such marvelous feats until the grounds for their menagèric performance is first prepared by acids. These gentlemen claim that the enamel must first be disintegrated before they are ready to attack the dentine.

With the belief that decay is produced from the action of acids upon the phosphates, together with other environments detrimental, as predisposition, etc., we are ready to make a few deductions :

First. Decay is arrested by removing that already begun, which implies as much of the substance as contains in its softened condition, acids, which could prove further injurious ; and hermetically stopping out all acids or those things which will gather about them acid, of whatever form.

As to what filling material is best to be used, I would say that which "stops out" acids. Beeswax, resin or a waterproof lid over the cavity, if it could be constructed, would probably prove a success. Yet I have never found anything so universally successful as gold, so poor as amalgam, so certain for the length of time it lasts as oxyphosphate cements.

When your patients come to you with teeth far more sensitive one day than another it is because of acid-taking, in form of lemon, pickle, vinegar or other foods. During your period of operating have them abstain, and recommend alkaline lotions to neutralize acids and destroy the sensitiveness by converting the exposed organic tissue into soap.

Recommend to your patients the greater importance of thoroughly cleansing teeth before retiring at night, certainly after the last meal. The time intervening before the next meal gives far greater opportunity for fermentation with the closed mouth, no flow of secretions to dilute, and the temperature of the mouth being up to $98\frac{1}{2}^{\circ}$ Fahrenheit.

If I were asked to give my opinion as to what is the cause of the deterioration of the human teeth in these modern days of civilization, upon which much has been said and written, would I

answer that the bone making material was bolted from the cereals we eat? No. Would it be the increase of, and greater susceptibility to germs? No. Would it be to deterioration of the general physique? No. But I would emphatically say it was due to the *saccharum officinarum*.

This plant indigenous to Cuba and Louisiana, yields the largest amount of those saccharine products mostly used in cooking and confections, and enters into most all the delicacies we eat and beverages we drink, and though not acid within itself, it is the great generator of them, and in the sugar plant we recognize the deadliest enemy to the human teeth.

We will close by saying that the greatest prevention of their injurious effects will be had in thoroughly cleansing the mouth after their use, before they assume the harmful acid form.

PRESIDENT'S ADDRESS.*

BY DR. E. B. WEEKS, LITCHFIELD, MINN.

It gives me pleasure to welcome you to this the thirteenth annual meeting of this society. It is twelve years ago that the first annual meeting was held in St. Paul, and many changes have taken place since then.

Few of the faces seen there will be here to-day. Some have passed within the vale; some have removed to other States, or gone into other occupations. Their places are being filled each succeeding year by new men, most of them with younger faces.

We are glad to receive them all, and our most earnest wish is that some way can be devised for increasing the membership of this society. Out of about 350 dentists in active practice in this State, our rolls show a membership of 103, not quite one-third in the society; and yet this is better than some older societies. The Illinois society has a membership of about 200, with a total of 2,000 dentists in the State; only one-tenth. Still, I think we should not be satisfied with less than one-half of the whole number. The society should represent the majority. The requirements for membership are such that no self-respecting dentist in the State is barred. No examination is required, no arduous duties imposed. The invitation to "come join us and we will do you good" is general; only those are excluded who will not sub-

*Read before the Minnesota State Dental Association, 1896.

scribe to and uphold our constitution and by-laws. It does not seem to me that there is a dentist in the State who would not be benefited by continual attendance at these meetings. We have in the society some of the best dentists in the State, some who have gained for themselves an almost national reputation, and they are all here for work. Each year at these meetings the new principles, new methods and new remedies are discussed or demonstrated. In this way all receive benefit by coming, and I am sure the society is benefited by their presence.

The executive committee have been very active in preparing a programme which they hope will interest. It is believed that the social features of this meeting will lend pleasure to it, and that next year we may meet at one of the lake hotels contiguous to St. Paul or Minneapolis, with a much larger attendance than ever before, and that our annual meetings will be looked forward to with pleasure, as an annual outing, as well as a meeting for the advancement of dentistry.

And now for the coming year what shall we do, that we may go forward, and not stand still or retrograde?

It seems to me that we should adopt some of the suggestions so often offered before, of some systematic line or lines of study, reading and investigation. I do not think that any one subject will interest all; but several subjects may be under consideration at once, then each one may take that subject that most interests him. Or it might be a good idea if the executive committee for the coming year should immediately, or within a month from this time, require different parties to prepare essays on certain subjects for next year, and that from two to four others be asked to assist the principal in investigation and elaboration of the subject, and thus be ready to thoroughly discuss the essays at our next meeting. I feel sure that something of this kind, that will keep up a sustained interest throughout the year, will be of great benefit to our society.

Much benefit might be derived if a number of members could be prevailed upon to keep a record of fillings of special materials, as oxyphosphate of copper, or of alloys of some given formula; or of methods; or of cataphoresis; or local anæsthesia by various methods; and these data furnished to some member designated for the purpose, who might incorporate them in a report which, besides being of immediate value to our society, might furnish valuable material for a report to the American Dental Association.

I wish to call your attention to the American Dental Association. It seems proper that we should be represented each year. We are entitled to one representative for every five members in this society, but many years we do not have a single delegate there to let them know of our existence. Would it not be well to elect several representatives and have them go if possible? Or rather than not be represented, would it not be well for this association to pay a part of the expenses of some one who will go, and if possible carry some fruit of our labor? Also that discretionary appointments be left in the hands of the executive or membership committee, that they may issue credentials to any member in good standing, who may find it convenient to go.

One of the first important subjects that engaged the attention of this society in the first year of its existence was the framing and procuring the passage of a law regulating the practice of dentistry. How well that work was done, years of experience have shown. That it has defects, we all admit; but after all it has many good points, better, indeed, than many of the laws of other States.

While other societies are debating the question of whether the State society should control the appointments to the State board, we rest secure in a law that gives us, at all times, three out of five on that board.

It gives the governor some choice, in that he may, if he sees fit, appoint two on that board not nominated by this society.

While the laws of other States make it obligatory on the board to grant a license to all who come with diplomas from reputable colleges, ours has what we believe to be the fairer course—examination for all who come. All prove in the same manner their fitness to practice in this State. It remains for us to watch and guard it. It will not take care of itself, and who should stand guardian over it if not the State society?

As eternal vigilance is the price of liberty, so it will ever be the price of maintaining this law. We believe it has enemies who would have it repealed, or so amended as to make it almost worthless. Therefore, we would say, watch.

The Dental Protective Association is a matter often brought up, and almost as quickly dropped; but I do feel that it is a worthy association conducted by honest men, that it is doing a great work with small support. It undoubtedly is saving every one of us both dollars and annoyance. I think we do not recog-

nize its results as we should, for its work is preventive rather than curative; but reasoning by light of past experience, we can only say that what the Goodyear Rubber Company did years ago the International Tooth Crown Company would have done, and done more effectively, and rubbed it in harder, had it not been for the Dental Protective Association.

It has successfully defended from fifteen to twenty suits, having won every suit brought against members. Several suits have been carried to the U. S. Supreme Court, where the Richmond crown patents have been declared invalid. One case, the Low bridge patent, was appealed by the Crown Company to the U. S. Circuit Court of Appeals. It was argued last May, but no decision has been rendered. Somewhere from ten to fifteen cases have been dismissed rather than fight the Protective Association. It is believed that if it were not for the work of this association, nine out of ten of all practitioners would have been paying royalty to the International Tooth Crown Company, and others, for the last seven years, and would be for many years to come; and a conservative estimate places the average amount saved to each at \$100 a year.

The association needs more members and more funds to carry on its lawsuits. We have been protected in the past, I believe we shall be in the future if the Protective Association is supported as it should be. If you are not a member let me urge you to become one at once, and bear your part of the burden in the fight against patent sharks.

Many advances have been made along almost all lines of dentistry during the short lifetime of this organization, and it may not be amiss to look back over these years and see what has been done. Then electricity was just beginning to find a place in dentistry. The electric mallet had been invented, and was being successfully used by a few. A few crude and noisy motors with battery outfits were trying to maintain a feeble existence. But electricity has grown in dentistry, just as it has in almost every other field of usefulness, until it finds a place in the office of almost every dentist in the land.

Motor outfits have been perfected both for the operating room and the laboratory.

Electricity for bleaching teeth, for cautery or hot air syringe, and lastly for a melting furnace and for cataphoresis. This last,

though considered one of the latest advances, was demonstrated at one of our meetings at St. Paul by Dr. McGraw, eight years ago; and though his appliances then were imperfect, the *modus operandi* has not been changed. The Executive Committee have thought this of enough importance to give it some prominence at this meeting, and have arranged for papers on the subject, also for demonstration of its use, so that you may all judge of its value and avail yourselves of its advantages.

Crown and bridge work was then in its infancy, and though some were doing very presentable work, many more were doing none at all; while some work was being done that was a shame to the operator who put it in, and a detriment to the profession at large, for while every success only counted one for us, a failure was advertised everywhere, and its evil exaggerated ten fold; and though failures can be found to-day, and will continue to occur, all its basal principles are better understood, and beautiful crowns and bridges are inserted that are models of beauty, strength and utility, perfectly fitted to their abutments and piers, strength where strength is needed, with interproximal space, contact and correct anatomical articulation all provided for. Nor have the dental manufacturing companies been idle, for they have put forth a line of goods especially adapted to this work.

Great advances have also been made in orthodontia, especially in simplifying methods and appliances. The substitution of German silver for gold has given us a cheaper metal, easily worked, tough and strong, or hard as needed. Traction bars and jack screws made of this material excel all others. Specialists in this branch of dentistry are coming to the front in many of the large cities. It requires special study, a high order of mechanical ingenuity and unlimited patience to be successful; but to those who possess the proper capabilities and attainments, it presents a very inviting field for work for the relief of deformed humanity. Indeed, there seems to be a general advancement along all lines in both operative and prosthetic dentistry; an increasing tendency to recognize principles and operate in accordance with their laws.

Dental literature has increased very rapidly in the decade just passed, and I cannot begin to name the notable additions; but of the most useful works I will mention The American System of Dentistry, an exposition of dentistry as practiced by Americans; Dr. J. N. Farrar's Irregularities of the Teeth, proba

bly the most comprehensive work on the specialty of orthodontia that has ever been written. It is certainly a grand work, worthy of a place in the library of every man who aspires to being thoroughly posted. The new edition of *Anatomy of the Human Teeth*, by Dr. G. V. Black, has become deservedly popular, and draws very sharply the line between the vague and the precise, both in anatomy and nomenclature. *Management of Enamel Margins*, and *Physical Characteristics of Teeth and Filling Materials*, by the same author, are works that cannot be too highly appreciated; and should be studied over and over by men in active practice, for they contain so many of the principles that must govern us if we would be successful.

Many good things have come to the notice of the profession at large through the medium of this society, having been presented by its members, and given freely by them to all who wish to use them.

The meetings we have held, and the papers, discussions and clinics have been of great value to those who have been in regular attendance.

We are just entering our teens at this thirteenth annual meeting, and before we attain our majority let us hope that we shall have a larger membership, a larger attendance and a much larger force of earnest workers.

THE CARE OF THE TEETH DURING PREGNANCY.*

BY T. B. HARTZELL, M. D., D. M. D., MINNEAPOLIS, MINN.

It appears to be a generally recognized fact that women suffer from dental caries very much more disastrously during pregnancy than at any other period in their lives, unless it be during lactation. So well is this fact recognized that among the laity the trite saying is often heard, "a tooth for every child," and indeed, many mothers are fortunate if they escape with the loss of only a single tooth for every child born by them. In order to discuss this subject we must first seek for the cause of this increased tendency of teeth to decay during the pregnant condition. Absolutely no research work has been recorded upon this subject that I am able to find, though the professions seem to recognize the fact that dental caries is much more prevalent among women during preg-

*Paper delivered before the Minneapolis Dental Society, December 18, 1895.

nancy than at other times. All theories in regard to the subject seem to be based on the clinical findings, and apparently little thought has been bestowed on the cause, and the idea in most theories advanced seems to be, that the teeth of the mother are decalcified and surrender their lime salts to benefit or build the bones of the foetus. This idea was quite recently advanced by Dr. Albert P. Brubaker in a paper before the Pennsylvania State Dental Society, and it is essentially the same idea that has obtained for many years among the profession. I am unable to find any authority among physiologists to support this theory, and I believe it to be erroneous, and cite the following reasons for that belief: First, the absence of lymphatics in the pulp as far as we know; the limited circulation of the pulp as compared with other tissues of the body; the absence of any special resorptive cell or digestive ferment in the pulp; the extreme density of the enamel and dentine; the course of decay and its manner of attack, from the surface of the tooth toward the pulp chamber, instead of the softening process progressing from the pulp toward the enamel, as would be the case if the pulp were resorbing the calcified tooth substance. Moreover, dissection of teeth extracted during pregnancy does not reveal a decalcified area contiguous to the pulp.

Neither is this increased tendency to decay due to a lack of lime salts, for it is a fact that bone building is going on in the body of the mother during pregnancy. This fact has been demonstrated so often that Lusk, in his work on obstetrics, says, "That in rather more than half the cases of pregnancy, thin, bone-like lamellæ, consisting of phosphate and carbonate of lime, measuring half a line in thickness, are found deposited upon the inner surface of the skull. These plates are called osteophytes; they occur about the third month and are found chiefly upon the frontal and parietal bones." This formation of osteophytes has been noticed by other observers. M. Larche says, "Out of two hundred and thirty-one women dying in the puerperal state, one-third showed well developed osteophytes between the dura mater and inner table of skull." This would seem to indicate that lime salts were present in abundance, and it is not logical to suppose that nature would pull down essential organs to build nonessential tissues. Then too, if a woman were limited to rice flour alone, as a diet, she would consume many more times than the re-

quired amount of bone building material for both her own nourishment and that of the foetus. Also, phosphates are always excreted in abundance during pregnancy. What then, are the causes of decay during pregnancy? Hippocrates said two thousand years ago that vitiated secretions were the chief cause of decay in the teeth, and perhaps he was right. I believe that a perfectly calcified tooth with a sound enamel coat, bathed in a normally alkaline saliva, would stand intact forever if the balance of the physical economy might continue to exist, and I think it is in the direction of vitiated secretions, caused by changes in the blood and disordered digestion with imperfect oral hygiene, that we must look, and that these changes in the blood and disordered digestion are primarily the result of a disturbance of the reflex nervous system. All the functions of life are under control of the nervous system. Interfere with one function of the body and you interfere with all.

While pregnancy should be a normal condition, and those changes, going on in the system purely physiological in their character, yet, among people of civilized communities, living under highly artificial conditions, many changes occur that seem to be pathological in their nature. These changes seem to commence with conception and continue through the period of gestation, and while many account their cause obscure, I regard them as primarily dependent on the nervous system. To illustrate this idea, note a previously healthy woman, having no nervous, gastric or other disorder. Very shortly after conception she suffers nausea and vomiting, especially in mornings. She may live ever so hygienically, be as careful as possible of her diet, yet still suffer these discomforts, and note, this occurs before the ovum has had time to attain sufficient size to beget pressure effects which might be responsible for these symptoms, and in the few cases it has been my opportunity to observe, the saliva has been found by daily tests to be altered in reaction, being distinctly acid. These attacks may, and sometimes do, resist all treatment or effort for their relief, when it becomes necessary to terminate pregnancy by artificial means to save the mother's life. While such cases are not common, yet obstetricians mention them as among the first of the conditions where abortion is justifiable. I think the above citation indicates conclusively that these effects are of purely nervous origin. All the fluids of the body become more or less altered.

Münde says of the circulation, that the corpuscles are decreased in number and the fibrin lessened in amount from the first to the sixth month, while the volatile matter and water are increased in amount. After the sixth month the fibrin is increased. These changes in the blood may be due to disordered nervous function, primarily, or more probably, indirectly, as a result of malnutrition because the digestive power is certainly lessened. This is evidenced in many women by loss of flesh and color, dark circles around the eyes and a drawn, haggard expression of countenance. That the altered secretions depend on these changes in the blood will not be denied, because they are elaborated from the blood. The salivary secretions are almost always increased in amount and altered in reaction. Sometimes the increase in amount is enormous. Cases are recorded where a bed sheet used as a kerchief was saturated repeatedly in twenty-four hours. The chemical reaction, normally alkaline, becomes acid and is ropy, containing more mucin than is normal. The gastric juices also suffer, for acid indigestion is a very frequent if not a constant condition. These changes still further impoverish the system and it is just here that damage to the teeth commences. These slightly acid secretions first decalcify the enamel coat, thus giving the germs of decay access to the dentine. As soon as a decalcified area occurs the bacillus most concerned in tooth decay can commence operations, and when once this foothold is gained will furnish of itself the required acid for further decalcification of the dentine, so that decay is an unceasing process. No better medium than this slightly acid solution could be found to give the germs of decay a foothold. Their decalcifying power is recognized by all students of histology as in the preparation of bone for cutting with the microtome the bone is treated for a sufficient length of time in a slightly acid solution, when it may be cut with ease with the most delicate of knives. It is reasonable that this hydræmic condition of the blood is in part responsible for other changes that occur in the system.

Pigmentation is one of the phenomena of pregnancy and occurs in many cases; it may extend over the whole or part of the face as well as over other portions of the body. The urine is altered, being more abundant and watery, and contains in the majority of cases a far greater amount of phosphates than usual. The whole nervous system becomes more impressionable. The

character frequently undergoes a total change. The most amiable woman sometimes becomes peevish and fretful, the spirits depressed, and this, too, in the earlier months of pregnancy, when the general nutrition should be least impaired; and this you notice is before any great demand is made on the system of the mother by the foetus, even before any microscopical alteration of pelvic organs occur. Melancholia in women, predisposed to insanity may terminate in mania. On the contrary, nervous, fretful women sometimes lose their nervousness and become quiet and placid in disposition. Neuralgic affections are most common, especially of the face. All these facts bear out the general idea here advanced, that these changes are the result of a disordered nervous system.

Constitutional treatment, then, should be directed toward maintaining the nervous system in a normal condition. This can be done only by close attention to the general bodily welfare of the patient—pleasant surroundings, change of scene if need be, plenty of sunshine, fresh air and a moderate amount of exercise, easily digested and nutritious foods well prepared, particularly those rich in the bone building elements, plenty of fruits. Fruits are rich in both phosphates and calcium, and may be used without stint.

Particular attention should be given the skin. The sponge bath in the morning and brisk friction to bring about that healthy glow and sense of comfort so much to be desired; the use of alkaline drinks, not because of their contained calcium particularly, but to maintain the normal alkalinity of the blood, and secondarily to neutralize the acid secretions of salivary and buccal glands. Lime water is one of the most useful—a tablespoonful with each glass of milk or water—Vichy, Carlsbad or Hunyadi water to regulate the bowels. Phillips' milk of magnesia—a most useful preparation both to regulate the bowels and to correct acid indigestion, and as a local mouth wash it has the quality of adhesiveness—used in the mouth, laved about the teeth, will leave a thin coating of magnesia over them, which will neutralize for the time being any acid ferment present there. Special care should be taken to keep the teeth clean, and simple precipitated chalk, containing no soap or other oily ingredient, is the safest thing to use on the brush; and finally, as the last attention, the teeth should receive before retiring an application of ordinary prepared chalk rubbed in about the necks of the teeth and into the interdental spaces

with the finger or small mouth napkin. This will keep the fluids about the teeth in an alkaline condition during the night, when the conditions favorable to decay are just right, namely, proper temperature, moisture, and comparative quiet, the lips and tongue being at rest. The morning treatment should be a simple mouth wash of borolyptol or pasteurine.

GINGIVITIS.*

BY L. L. DAVIS, D. D. S., CHICAGO, ILL.

In selecting this subject as a topic for discussion this evening I had in mind a paper by Dr. W. A. Mills, of New York, read by him at the union meeting of the Washington City Dental Society and the Maryland State Dental Association in April, 1895, on "The Toxic Effect of Quinine on Gum Tissue," in which he says: "The first condition to attract my attention was the peculiar anæmic and frozen-like appearance of the gum, especially that portion filling the gingival spaces." He proceeds to state that on close examination no attachment whatever of the gums to the teeth from the cervix down to the alveolar ridge could be found, although apparently there was no separation, owing to the gum hugging the teeth closely.

The general condition of the mouth in the primary stages of this disease is the cleanly and apparently healthy state of the teeth and surrounding parts, but as the disease progresses there is a wasting and contraction of the tissues surrounding the teeth which eventually terminates at the alveolar border. All signs of wasting then disappear, leaving the teeth clean and apparently elongated. During the entire progress of the disease there is at no time any pus formation, as in pyorrhœa, no congestion of the tissues, no calcareous deposit of any kind; no sense of pain or tenderness in teeth or gums, the patient being unaware of any abnormal condition.

He thus calls our attention to a new dental lesion not heretofore described in dental literature, and then as the result of his observation advances the theory "the habitual use of quinine without the advice of physician or dentist" as the cause. He says all the well-defined cases were found in mouths of patients of nervo-bilious temperament, ages ranging from eighteen to thirty

*Read before the Odontological Society of Chicago.

years, and that all were chronic sufferers from neuralgia, colds, malaria and general debility.

Dr. Mills' paper describes a condition of the gums that has been noticed by the essayist a number of times, but in patients of a totally opposite character from those Dr. Mills described, and the cause ascribed to an entirely different source.

Dr. Mills fails to state the sex of the twelve cases observed by him, and therefore our comparison in this respect cannot be made.

No regular data has been made of the cases observed by your essayist except during the last few months, and this is the result:

A. B., male; age thirty-eight; large and well formed; active; teeth with few cavities; gums blanched, firm, but receded considerably from enamel margin, and seemingly tightly attached, but scaler shows that there is no attachment to teeth except to labial surface of right superior cuspid; recession more marked on palatal roots of right superior molars and left inferior molars; very marked on left superior and inferior cuspids and incisors; mucous membrane of palate white and hard, with rugæ strongly outlined; a few nodular eminences with bright red center on the right side of hard palate, tongue whitened, but with fungiform papillæ strongly marked.

History. Health always good; outdoor occupation; seldom had a cold, although there was evidence of mild catarrhal trouble; an inveterate smoker, smoked from ten to fifteen cigars a day, and sometimes a pipe at home; cleansed his teeth twice a day, and saw a dentist every year; very little salivary calculus, and only on lower anterior teeth and upper molars, but almost a black covering on the exposed roots, especially on palatal surface of superior and lingual surface of anterior inferior teeth; seldom took quinine.

X. Y., male, age twenty-two; well built, but a trifle slow in action; teeth of good character except first molars; gums whitened and hard, with a marked stippling; gingivæ of the anterior teeth on right side showing most strongly the nonattachment to teeth, also the gums near palatal root of superior first molar on left side; some salivary calculus on lower anterior teeth, very little on molars; superior teeth blackened on palatal side; calculus black and hard on the lower teeth.

History. Smoked a meerschaum pipe nearly all the time in office, and held it between the cuspid and lateral on right side, so the smoke could not then get into his eyes when writing. No

malaria; had a cold once in a while; took quinine sparingly, and hot whisky often when he did have a cold.

J. L., male; age fifty-four; lake captain; seldom went to the dentist; calculus on nearly all the teeth; roots exposed and black, gingival or interproximate space large, slight reddening where calculus was present; gums hard and white, tongue also white except where the fungiform papillæ showed; pyorrhœa present at inferior left central lateral and cuspid, also marked on palatal and proximate side of superior lateral and cuspid; buccal surface of roots of molars on right side decayed and blackened; smoked considerably, holding cigar or pipe on left side of the mouth; chewed when not smoking, and usually held quid on right side; took quinine when he thought he needed it, but not frequently, usually in 3 grain doses at intervals for twenty-four hours.

These, together with observations made other times, has led the writer to infer that the wasting of gum tissue or recession was probably due to the extreme use of tobacco, with possibly an inherited tendency to gum absorption. It is evident that there is no pain or inconvenience attendant upon the disease, for as a rule the patient comes for services in the nature of filling, and is not suspecting a new disease to be sprung upon him. The total absence of malaria, general debility, etc., in these cases, and the sparing use of quinine, certainly cannot warrant the assumption of quinine poisoning; and from close questioning nothing can be deduced that would lead one to suspect mercurial poisoning, for, as Dr. Mills has observed, there is no wasting of bone tissue or loosening of the teeth (except the one case cited with pyorrhœa present). Many times the patient may be wrongly suspected of mercurial poisoning when other causes prevail. One patient, at present under treatment for gingivitis, a neurasthenic female, age twenty-nine, recently presented with mucous membrane of both upper and lower jaw a brilliant red; the slightest touch caused the blood to flow, and hence the disease was aggravated by the presence of decomposing food particles and mucus upon the adjacent teeth, through the patient's unwillingness to thoroughly cleanse the teeth; the gingivæ between the lower cuspid and lateral on left side swollen considerably, and detached from the teeth; only very little calculus was present, and the disease not present on the lingual aspect, nor were the gingivæ detached or swollen to any great extent on the other lower teeth;

pyorrhœa was present at the palatal and proximate sides of the superior incisors and cuspids; ptyalism is quite marked. The cause in this case is undoubtedly pregnancy.

Before closing, one other case, the cause not so clearly defined, in a male, age twenty-one, of fine physique; good habits; his family physician a personal friend of mine, so that I could have readily obtained any history of taint, presented with gums apparently normal with the exception of those of the eight anterior teeth of upper and lower jaws; slight deposit of calculus, but not sufficient to warrant my ascribing the disease present to this cause. The gingivæ between each of these teeth had sloughed, leaving the gum tissue in an almost straight line for the anterior teeth, with very little swelling or redness except at gum margin. The trouble responded readily to treatment with nitrate of silver and the constant use of a mouth wash.

The many forms and causes of diseases of the gums require careful tabulation, and I present these cases hoping to draw out a good discussion, so that we may all benefit by it.

PROCEEDINGS OF SOCIETIES.

MINNEAPOLIS DENTAL SOCIETY.

Dr. VAN DUZEE opened the discussion of the paper by Dr. T. B. HARTZELL: On many of the points I cannot agree with Dr. Hartzell, and think his theories and deductions are influenced somewhat by the opinions which have been current among dentists for so many years, and which I believe are not founded on facts. Personally, I do not think teeth are more liable to decay during pregnancy.

The subject is a broad one, and many factors enter into the result. There is no question but that teeth do decay; but is it because of pregnancy, or because circumstances are favorable to decay aside from that condition? May we not have the same result from diseased conditions? I have seen the same results in young men just merging into manhood.

It seems to me we are on the wrong tack, and I want to go on record right there. We do not have the chance to treat these things as we should. That confidence existing between the patient and the family physician is not cultivated between the patient and the dentist as it should be. If it were they would come to us and

give us the opportunity to do the best we can from our own standpoint. We see these cases after the damage has been done. The most critical period is during the first few years after marriage. The patient is more apt to be guided by the questionable advice of older women, and is governed by feelings which pass away after experiencing the painful effects of neglect. I think we are largely to blame for not educating our people to depend upon us as they do upon their physician.

It seems to me that under these circumstances the teeth suffer from a number of causes. The expectant mother lives under many distressing conditions. Her life is not a particularly pleasant one. Everything is against her. She is more liable to neglect her teeth during her illness and leave them a prey to unhealthy surroundings than at other times. I agree with the statement that the saliva is vitiated, but I deny that it is because she is pregnant. It is because of the great number of other things that enter into her life. The average young mother lives a life quite foreign to that which nature originally intended.

The matter of diet and hygiene is one to be considered carefully, and at greater length than can be done at this time. We find the woman battling against circumstances and conditions, and should work to build up her vitality. Remove as far as possible every block in her pathway; make her as healthy as you can, but I do not think you can do this alone by chemical theories or medical formulas; use common sense, and consider thoroughly what is to be battled against. Practical treatment should be more considered, and we must depend largely on plastic filling materials. Every additional fifteen minutes in the chair is straining the already overtaxed nervous system, and injuring the patient perhaps for life. I do not think it is the time for anything but the most careful temporary work.

If there is the slightest tendency to exposure of the pulp I would be more careful under these than any other circumstances. The woman must be confined to the house for some time and may not be able to come to you. You must not cover up anything that may be a source of discomfort or suffering. Use pulp protection in questionable cavities. The doctor speaks of the nervous system controlling function and being in an excitable state, but I do not think the nervous system in itself does control these conditions. He speaks of diet and hygiene a little differently from what I am disposed to. I think because these cases sometimes get a little

beyond the physician's control, there is no reason to say it is due to disordered digestion or function of any kind; but that if diet and hygiene fail, it simply goes to prove that the individual has not vital power enough to overcome the unnatural conditions of the life we lead to-day. If we are to proceed along scientific pathways and work out our salvation as professional men we must go deeper than the point of view, and the text-books and writings we have at our command. We must do individual, original, thoughtful, self-sacrificing work.

Dr. WRIGHT : I do not believe there is any difference between caries during pregnancy and at any other time.

Do the teeth decay more during pregnancy, or is it only more apparent? The saliva is vitiated, but Prof. Black, in 1880, after examining several thousand cases, said he believed acid saliva caused the teeth to decay. If decay were due simply to acid saliva, the teeth would dissolve as a whole, not only at point of contact. It is not due to lack of lime salts, for in cases of injury during pregnancy, the bone will unite as quickly as during any other time of life.

The unimpregnated uterus lies in the cavity of the true pelvis. It is two and one-half inches long by one and one-half in width. The plexus of nerves supplying it is also in the true pelvis. The uterus does not leave the cavity of the true pelvis until the end of the third month, when it is five inches long by four and one-half in width. The pressure on the nerves from the enlarging uterus, together with the change due to the rapid increase in the size of the uterus, make a profound impression on the general nervous system of the woman. When the nervous system is all right little troubles are unnoticed. At other times small cavities in the teeth give trouble and call the attention of the patient to them. Then there is the belief among women that during pregnancy it is unsafe to have anything done to the teeth; and they go a year to fifteen months without visiting their dentist.

Pregnancy is a physiological not a pathological condition. I think the ruin that occurs to the teeth of pregnant women is from ignorance and neglect and not from disease.

Dr. WEISS : I think the essayist has covered the ground pretty thoroughly. I think he has treated the matter about as I understand it.

If there is a greater amount of caries during pregnancy, of course, there must be a cause for it, and if it is due to vitiated

secretions, how do these vitiated secretions occur? I don't see what other cause there is than through the nervous system, and it seems to me our treatment should be directed to the nervous system. If the family physician is not able to abate the condition outside of the mouth, correct the nervous disorder, we are going to have quite a struggle to overcome the vitiated secretions in the mouth. We have got to have something that is practical—something that can be done by most people. All young women cannot do as the essayist has outlined in the matter of treatment. They have got to do as they can. Our treatment should be directed in as practical a way as possible.

Dr. OWRE: It is very seldom I say anything extemporaneously, even if I do know all about it. However, I think the condition is partly due to the increased acid condition of the saliva. One of the gentlemen remarked that bone would dissolve in acid solution, as an explanation to the increased decay. Well, that hardly holds good in the case of the enamel covered tooth, but add to this the increased amount of putrefaction, then perhaps his statement would seem more reasonable. I think I agree with Dr. Hartzell that the nervous condition has much to do with it. Physicians should always direct treatment to the cause. Symptomatic treatment is generally resorted to, when etiology is somewhat obscure. If the patient complains of any special ailment I think I should treat that and let the neurosis go.

Dr. HARTZELL: I think my associates in discussion have agreed with me in the main, even as to decay of the teeth being more prevalent in pregnant women, but they attribute it to other causes. In regard to the acid condition of the saliva they seem to have overlooked the great protection of the lips, cheek and tongue to the teeth. You rarely find decay on those surfaces swept clean by the lips and tongue. Also the fact has been overlooked that slightly acid saliva on very hard enamel would take a very great while to decalcify the exposed surface enough to break down the whole surface at once. They also overlook the fact that between the teeth where the food accumulates, and fermentation goes on, the acid accumulates, and gradually, through a long series of weeks or months, this decalcifying process continues. That decay can occur in hard tissues consisting largely of inorganic matter, is practically admitted by all to be impossible. Some process must have taken place whereby these tissues lose their organic matter in order that the process of decay can be initiated.

THE ODONTOGRAPHIC SOCIETY OF CHICAGO.

The meeting was called to order by the President at 8 P. M., September 14, 1896.

Dr. W. GIRLING then read a paper on "Dental Journalism from a Layman's Standpoint."

DISCUSSION.

Dr. OTTOFY: I had the pleasure and the privilege of seeing Dr. Girling's paper and becoming acquainted somewhat with what it contained. There is nothing therein to criticise, but I can say a few words in addition to what has been said in the paper.

Mention was made in the paper of the young man who is always afraid of the critic; that men appear before societies and are squelched, as it were, by the critic. I do not believe that at any time, a worthy, able man has ever been squelched in such a way as that. I have seen it occasionally, that older men of societies have treated a subject in such a manner as to discommode the young man. But I have never seen a young man who was worth anything, who cannot get out from under, and get to the top. So I do not think a man need ever be afraid to say or write anything on account of the critics. I remember well receiving articles of mine returned from dental journals and from literary magazines, marked "not desirable copy," or "returned with thanks." A fellow need not be afraid of that. He can simply lay that aside and write something better, and after a while a time will come when the products of his pen will be accepted. Hence I say a young man need not be afraid to do the best he can, present his work to a dental journal, and as a general rule find it accepted.

As to the want of originality of authors, I might say this, though it may surprise you, but the dental profession is more prolific in writers than almost any other profession. We have more good writers among us in proportion to our numbers, than the medical profession has. Legal writers, lawyers, are comparatively few. That is, the literary work in the legal profession is done by but very few men; in the medical profession, the proportion of writers is such that our profession need not be ashamed at any time to stand alongside of any of the professions and compare its writers of ability.

I just looked over a table prepared by Dr. Black in 1893. He looked over the dental literature for two and one half years, of 1891, 1892 and first half of 1893, and he found during that period that there had contributed in the English language to American journals 1,252 persons a total of 2,600 journal articles. Then he gives England, Germany, France, Italy, and so on. Now then, for the United States, that would make about an average of 500 writers a year, for the period of two and one half years, 500 writers out of about 15,000 to 18,000 dentists. Take 500 articles and read them in a year, and it is a good deal. Now these 500 writers contributed good, bad and indifferent literature, all original communications, some of them short, some of them long. If boiled down and the gist of it presented to us, we would have something like 300 articles of good solid interesting matter to read during the year, and that is a good deal. It is true that much of our writing is short and practical. Dental writers are brief; they do not write long-winded articles, they usually are short, pithy and to the point, just as the paper we listened to to-night was.

How to read a journal? I think we differ in that, and I think we should differ according to the journal we read. I like to take the *Cosmos*, begin at the back and read forward, having looked at the table of contents first. I like to look over the advertising pages of that journal first, because I consider the *Cosmos* one of our best journals; when I eat pie and have only one cut to eat, I always eat the crust first, because I do not like the crust, and that leaves me a nice piece of pie to finish with. I like to go at it in the same way in reading the *Cosmos*. I read the short pieces that I do not care so much about, first; and gradually come up to the article that I want most. It may be in the middle, or first or final part of the journal, but when I come to it I want to settle back in my chair and get the light just right, and then enjoy it. I read the magazines the same way. I like the journal to which the essayist referred, that has the pretty pictures of the actresses. At times that is just what I want. Then again I want the *Century* but there are times when I cannot read the *Century*, then I want to read other, lighter magazines.

So the habit of reading journals is in a measure governed by the time when we read them, and probably also by our own age. A word as to the age of the reader. Generally, when a paper like

this is read, subjects are presented to us as though we were all at the same age, and as though every one of us wanted exactly the same thing. Now, that is not so. A man at forty needs different literature from the man at twenty. He should read different literature; his time is differently managed, his wants are different, he differs in every way from a man that has had twenty years' experience. As a rule his inclination tends to different literature. He may have read a good deal, and hence, as the essayist has said, he glances over the journal and has already acquired what he needs. Another man, a young man, must read very closely, and re-read, in order to acquire the same thing. For five years I read every scrap of dental literature that fell under my eyes. Without claiming anything for myself that others do not possess, I have acquired a way of reading journals so as not to take too much time. I know that a man generally, in reading a paper, makes an opening oration, he usually starts in and makes a few pleasant introductory remarks, and I have learned to skip all that. As a rule, in opening a scientific article, to place the subject clearly before his auditors, the essayist frequently goes into an elementary exposition of the subject. To one who has read, much of that is not necessary, and finally he comes down to the real gist—it may be half a page, or less. All you have to do is to read that. Skipping that way, you avoid a great deal of unnecessary reading. By constant reading you will soon discriminate among men who write what is worth reading, and men who write what is not worth reading.

Then again, I do not read everything; that is, I do not care for everything. There are certain departments with which I am not familiar, subjects not to my taste, and I am not trying to learn much about them. All I want is simply to keep in touch with the progress of these departments.

The essayist mentioned one other important subject, and that is, having material presented to us in the form of digests, in the form, as it were, of a "review of reviews." A number of attempts in that line have been made, but none of them have as yet succeeded. When the DENTAL REVIEW was organized ten years ago, in this city, and with which I was connected, it had the same object in view that the *Digest* has to-day. That is, we intended to give a review of all magazines, and give the best of everything to the readers from month to month. Well, that was impracticable;

first, because the journals came irregularly; second, it was an enormous amount of work for which there was no compensation; it was a labor of love. Now you know labor of love is not done for a long time by any one. New men have to take the places continually, and new men must learn; so that it did not turn out well, and we put in papers and communications that we received, and gradually entered the stereotyped rut that things of that sort soon find. I see the *Digest* has similar trouble.

Another thing that that character of literature contends with is that men differ in what they want digested. Take a digest of a lot of matter that I do not care about, and it is no good to me, while again, things that I want to read may not be properly digested. The man may have left out what to me is the most important. In digesting or reviewing consequently, a good review or a digest is a difficult thing to secure, and yet, in view of the pressure upon our time, that is what it will have to come to.

Another thing that the essayist mentioned was a weekly journal. I have by experience found that it takes money to run a weekly publication; and as I had some bitter practical experience in that line, and can speak upon it, having published the only weekly dental publication in the United States. Abroad there are a few journals published once a week, in Germany, but they are not satisfactory from my point of view. They are practically advertising sheets with an article or two, which is usually a translated article from some American journal. It would be no advantage to have that come once a week. But the weekly idea is good in this way: I apprehend that when we get our news condensed at shorter intervals, more frequently, we are more likely to read them. For that reason I believe in the adoption of that plan of popular education. I think it does more good to have a little slip of paper on which it tells what a certain disease is and how to treat it, than to distribute a large pamphlet. They will lay the pamphlet aside to read it at an opportune time, and that time never comes; while the slip of paper is read on the car going home. Hence, a short journal coming once a week would be read more extensively than a journal coming once a month. I am satisfied that almost every one of us (if it came on Saturday in time before leaving the office at noon) would take it with us, and probably before Monday morning at odd moments would have pretty well read the journal, whereas, as it is now, what has been

done with the monthly journal? A good many lay it on the shelf, to be read sometime. That time never comes. Others read something partly that they like to read and then lay it to one side with the hope of reading it later. That time never comes, and the majority do not get as much out of it as they ought to get.

An idea that I suggested once to Dr. Harlan that seems to me feasible in connection with a journal, and without causing much additional expense, was this: That instead of continuing to publish once a month as now, send sections of the monthly once a week, say sixteen pages each week. At the end of the month the journal would be complete. After an article is set up, send sixteen pages this Saturday, sixteen pages next Saturday, and so on till the journal has been sent out. For those who do not care for these weekly installments, simply set these pages to one side and print the regular monthly issue and mail it in one. I would get mine in sections, and the method becoming popular, eventually journals would have to be published once a week, with a full corps of editors.

Dr. CROUSE: I was in hopes to learn something by coming here. There is much in the subject of journalism that I would like to find out, and so many problems that have bothered me, that I thought I might get some help here to-night. I have been more interested in the subject since I commenced publishing a journal.

I have been among the leading men of different cities throughout the country considerably since I commenced publishing the journal, and I venture the proposition that not one-fourth of the dental profession, even among the leading ones, read and take the journals. Now that may not hold good among the younger men, and yet I am inclined to think the fault is there also. There is something about the practice of dentistry which unfits men for other things. It is laborious, and takes a vast amount of nervous energy. There is no easy place in it, at least I have never found one. If you have not a good practice, you are not easy. If you have got a full practice there is no easy place, and the consequence is your energy is used up in your pursuit of a livelihood. Therefore, I have speculated whether or not a journal one-fourth the size of the leading journals, which have about sixty-four pages, would not be better.

Now let us come to the *Digest*. I had an idea when I started

a journal that I could fill it with digests of the other journals that come out the month before. But the average dental journal does not have very much pith in it, it is a rehash from one to another. It is often filled with papers that have been read in societies. You talk about original articles. How many original articles are there in the dental journals of the United States? A paper that has been read here is not original, it is a paper that has been read at the society. That does not hurt it, but nevertheless it does not come under the head of an original article. Then it is copied, and the journals copying do not say that the article has been previously published by another journal. They are not fair with each other; there is a lack of genuine integrity throughout the transaction. Well, what is the reason? There are but very few journals that are published to-day that are not trade journals, that are not dominated by some supply house, and it is very hard for a journal to live that is not.

I went in and subscribed to the stock of the International Dental Journal Company when it was first organized, with a view of having an independent journal that need not be dependent upon supply houses, or colleges, or any body else that was doing wrong. But we could not live as a journal. I was on the board of directors for several years, and we kept losing money. Without the advertisements of supply houses it is almost impossible to conduct a dental journal on the meager subscriptions that it gets from the dental profession. I do not know that I blame the dental profession for it. They do not care to pay \$2.00 or \$2.50 for a journal that is not worth the trouble of removing the wrapper when it comes. What are you going to do about it? I was in hopes that I would get something to help me solve that question. First, how to get articles that dentists will read, and how to get the dentists to read such articles.

When the *Digest* was first started I wrote some articles, giving in substance the experience that gave me what little success I may have had. I venture the proposition that one-half the subscribers to the journal did not read those articles. I would have continued in that line longer, and shall probably take it up again, but I did not feel much encouraged by finding out how this one and that one had not read the articles, did not know anything about them. They were laid aside with the expectation of taking them up again. In the enormous work that was thrown upon me

when I undertook the defense of the rights of the dental profession in patent litigation, I found it did not do to lay aside anything. That experience has been worth a great deal, and I have learned to pick up my journal almost as soon as it comes and go through it. Of course I do not read everything. From knowledge of the men and from being able to scan over and to leave off the preliminaries, and many times a great deal of an article is preliminary, I can get the substance in a short time.

But when it came to digesting an article, I made some digests myself, and I made every man mad that had written an article, because I threw into it my criticism. So I got my son, who did not know anything about dentistry, to make the digests, and he simply quoted and stated what the writer had stated. That has not created any ill feeling. If it has not done any good, it has not done any harm.

I have written a little editorial this month. The looking into our patients' mouths, the trifling things we have to contend with with our patients, the coming in contact with a very few people proportionally to what other professional men do, narrows the minds of the dental profession and makes them critical and skeptical, so that they cannot look at a fellow practitioner's sign without a desire for a scalp. Now that all ought to be remedied somewhat by our literature, but in order to do that the journals must have a larger subscription.

If I could have subscriptions enough for the *Digest* to throw all advertising to one side, which I would like to do, I could then try to better some of the existing conditions. I would have my journal full of editorials on the needs of college education, on the opportunities of supply people, on the duties of the patient to the dentist, and *vice versa*, and I would like to make the journal a little more spicy. But let me start with such a plan and I would have to carry it out at my own expense, because whoever I criticised would not give me an advertisement.

I have never known a dental journal to be independent and be a success. Every one had to retract and take the advertisements of supply people. Then what? It could not criticise their wrong doing, because then it lost their patronage.

I would like to get enough subscriptions for the *Digest* that I could furnish it to the dentists for one dollar, and only to any one who sent a dollar bill at the start. This saves dunning and would

do away with this experience—you get word through the post office that the journal has been refused. You look up the man and he has not paid for it.

I believe that we will yet make the digests the leading feature of the journal. But it will not do for me to make them, because I would have every man mad that wrote a paper. It is almost impossible for me not to throw into it little suggestions and criticisms. And some of the fairest minded men in Chicago made some digests for me at the start, and they did the same thing and had the authors writing to me, red hot about it. The criticism was all right, but they did not want the criticism when they could not answer it. The disposition to criticise is very great in the dental profession. I have probably told you before that when we take testimony we never allow two dentists in the room at the same time, because the second man will try to knock the statements of the first one out.

Let us go back to the trade journals. I have said the majority are simply advertising sheets, gotten out by those having supplies to sell. They are all violations of the postal law, and if it were enforced as it ought to be they could not go in as second class matter. The medical journals are a good deal worse, for they are published by the houses that manufacture pellets, etc. Almost every medical journal is published in that way, and there are tons and tons of that kind of matter which goes through the mail and makes it necessary for us to pay more for our private matter than we ought. Some of these days we will get somebody into the government that will knock that whole business out.

Now a man who runs a journal for a supply house has got to be a coward. I do not care who it is. He says: "I do not care, I do as I please;" but as long as he pleases to do what his house wishes he can do as he pleases, and when he does not do that he is hauled up. I venture to say that this proposition cannot be contradicted.

If I were going to improve journalism, I would say first, let the decent practitioners unite, say what sort of a journal they want, then subscribe for that journal and let it be run in the interests of the dental profession. For you can do it. If you had ten thousand subscribers you could publish a journal at a dollar a year. With ten thousand dollars you could run the journal independently and you could take whatever advertisements you

wanted. I do not say to shut out the advertisements, because such a journal would be profitable to advertise in, but do not be dependent on advertisers:

I have not given up the idea that I am going to have every decent man practicing dentistry in the protective association. I shall work it one way or the other so they cannot afford to stay out. If we had 10,000 dentists in the association and they took the journal, could not we publish a journal? That is just what we want. We want to band together 10,000, and after we get 10,000, the other fellows will be very anxious to get in.

Dr. ARTHUR HENRY MURDOW: I take three journals, and read each through every month, the *Dental Cosmos*, the *Digest*, and the *Items of Interest*, and I must say that I thoroughly enjoy them. I cannot understand, in thinking it over this evening, why a man who is interested in dentistry would take a journal and because it came once a week read it any more than if it came once a month, provided he had the whole month to read it in. If it came once a week, and there was just as much matter proportionately, he would have no more time and would be as likely to shelve it as a monthly, because when it came at the end of the next week, he would find he had not read the one of the week previous. The most feasible idea to my mind, would be a quarterly. I must say that I prize the *Digest* very much indeed. I take the *Cosmos* because it has some very fine articles in it, that take, of course, some time to sit down and think over. I take the *Digest* because I can sit down and get in a very few minutes articles that are not contained in the *Items* or *Cosmos* or any other two journals. I can read the three journals and can get just about all there is, because if there is anything special in any part of the country, it is sure to come out sooner or later in one of the three. The only trouble is that it is likely to come out about three times, once in each journal.

On motion, the meeting adjourned.

ST. LOUIS DENTAL SOCIETY.

Discussion of paper read before the St. Louis Dental Society by Dr. E. S. Chisholm, April 7, 1896.

The discussion was opened by

Dr. KENNERLY: I am not prepared to enter into a lengthy

discussion, but we know that southern people suffer from decay on account of the things they eat more than they do in the northern countries. I have been told by a gentleman residing in California that decay was produced by eating fruits. Now in regard to the prevention of decay, and particularly, as it takes place largely at night, I think as he does that wherever practicable we should instruct our patients in the thorough use of the brush before retiring at night, and I would like to recommend the use of Phillip's milk of magnesia. I have used it where the acid condition was so marked that there were reddish spots on the enamel of the lower teeth, and have found it very beneficial. I would recommend its use and I think that you will find it beneficial.

Dr. L. A. YOUNG: I did not come with the expectation of saying anything, but the paper was very well prepared. I do not wish to recount any of the points where I agree, but I wish to speak of some points where I disagree. It has been said that candy is injurious to the teeth, but I have found that soda crackers are more injurious. I have had children come to me with their parents, and the parents would say, "I do not see why the teeth decay for they do not eat candy." I ask, "Do they use soda crackers?" and the reply is "Yes." I think soda crackers very injurious. (?)

I am a firm believer in the germ theory of disease. There is another point that the doctor spoke of and that is thick, tenacious mucus, and I must agree entirely that where that is found we can hardly do anything for the patient. I have tried to relieve cases where I found this thick, tenacious mucus, and if any one can give light on this subject I would be glad to hear it.

Dr. ANGLE: I do not know that I have anything special to say. The paper covered very nearly what I believe in regard to it. I do not know that it will ever be fully settled as to the exact cause of caries. Different authors seem to have theories which settle the point to suit themselves, but none of the theories seem to be generally accepted. The germ theory, conceived largely by Miller, seems plausible, but I am not willing to accept any theories resting on one man's work even though he be as eminent as Prof. Miller, whom I admire very much.

I liked what was said in regard to the injurious effects of sweets. I firmly believe it is one of the greatest detriments to

teeth at the present time, whether in the form of confectionery, soda crackers or what not. I believe that one-fourth of my income is derived from the injurious effects of sweets upon the teeth of children. I think it is one of the causes of dental irregularity. I have watched it for years, and I think in a large per cent of cases caries results in the premature loss of deciduous teeth and the consequent irregularity. I do not think it holds universally good, for I have found cases where sweets are used without any apparent disadvantage, but in most cases where a lump of candy is used two or three times a day, or sweets of one kind or another are allowed to rest in the mouth, the fermentation will cause decay. Prof. Pierce said he believed that children ought to have sweets, but he recommends sugar as it is not so enticing as candy; but children do not care for much sugar, but when candy is allowed with all the extra enticements too much would be used with detrimental results. I think the subject ought to be talked of more and parents instructed in this regard.

Dr. J. C. CHISHOLM: I thank you for the privilege of saying a word or two. I cannot agree that the sweets that we get from fruits will cause decay of the teeth; if that were true then the fruit eating animals would have very bad teeth, and it is given up by our brothers, the physicians, the medical profession, that a good fruit season is a healthy season. Fruits, I think, promote health, and as to candies, I do not think it is the sweetness that causes decay. I think it is the impurities in the candy. Pure rock candy will not cause decay, but if you take a cheap candy with coloring and so on, I think it will cause trouble. As for southern people, I have had twelve years' experience in the south and only one this far north, and I think if there is any difference it is in favor of the south, but I think where one eats hot bread it is injurious to the teeth; but where we are crowded in flats, as many of us are, we have to eat bread already prepared and it must be masticated pretty thoroughly, and judicious exercise is good for the teeth as well as for other parts of the body. That is one of the things I do in treating an alveolar abscess, I instruct a moderate use of the tooth, not too much but it wants exercise. Clean teeth will not decay unless from a hereditary cause. Defective enamel will cause a predisposition to decay.

I am not acquainted with the germ theory, as I do not study from the standpoint of the microscopist, but I know these things

exist, such as microbes and bacteria, and I think cleanliness is the best remedy. Phillip's milk of magnesia may be good, I have not tried it, but I have tried some other things and my conclusion is that anything is good that will cleanse a tooth, but I would recommend pyrozone as a universal mouth wash. I do not think there is much objection to be raised to the use of candy. In other words it is not so much the presence of sweets as it is of acids that causes the harm.

Dr. J. P. HARPER: Dr. Chisholm says we have not been able to produce artificial caries, but we have. Dr. Miller has done it and I have seen it. I have seen the specimen prepared by Miller himself. The doctor says that in the south in sugar countries the teeth are bad. Why is it that negroes in Cuba have perfect teeth? I have understood that they have, and they live almost exclusively on sugar cane. It may be due to the exercise of the teeth.

Dr. WINDHORST: I did not hear the paper but from the discussion I would judge there was a reference to the action of fruits being injurious to the teeth. I cannot agree with this because I know people who live almost exclusively on fruit, and they have the best teeth of any persons I ever knew. I know a gentleman eighty years of age, who for the last twenty-five years has eaten an apple just before retiring, from his own story, which I have no reason to doubt, and his teeth are good. I think if we would eat ten times as much fruit as we do there would be a much better condition of the saliva and of the stomach and that that would cause a better condition of the teeth.

Dr. MANHARD: I have noticed where children are allowed to eat all the candy they wish and are compelled to brush the teeth it is seldom injurious. I think you will find in the majority of cases where the teeth are bad it is more due to neglect of the teeth than to sweets.

Dr. COYLE: I think the probability is in most cases where we find the child's teeth are bad that the mother, in nursing the child, has not eaten the proper food to give teeth the proper constituents, and when the child grows older it is allowed to eat what it wishes without regard to the teeth. I do not think that candy and sweets have so much effect upon good teeth and dentine as causes of malnutrition, but one tooth may have caries and the other side be well and sound, and that condition may have existed for years, and the microbes must have moved around without doing any damage. I

think starch and glucose have a bad effect by softening the enamel. You will notice when children present themselves to you there is a thick coating of starch that is held there by thick mucus. I think pyrozone is good and has proven a success.

Dr. EISLOEFFEL: The paper was very good, and caries of the teeth is something we are trying to overcome every day in our offices. I find that the healthy person has the best teeth, and I think the best preventive against decay is health and cleanliness of the teeth. I do not think there is anything better than clean teeth. There are some persons who do not keep their teeth clean, and I do not care how many times those teeth are filled or who fills them it will not save them if they are not kept clean. I know all I ever did was to keep my teeth clean from the time I was fourteen years of age. I was not educated to it before that time, but then I was taken to a good dentist and had my teeth filled up and was proud enough to keep them clean. I do not think my teeth were in a very good condition, but I think health and cleanliness is what saves teeth. I know a man about sixty-five years of age who has every tooth as sound as a rock and has never had the toothache. He is healthy and strong, and I have known many others in the same state. As I said before, you may fill the teeth all you like; it is not any use to fill them unless the patient will care for them.

Dr. W. M. BARTLETT: For the sake of argument I will state that one has said that sugar has no injurious effect upon the teeth, and another says that starch is injurious. Now what becomes of that starch? It is not converted into sugar in the stomach but in the mouth, and if candies have an injurious effect these other things must have an injurious effect.

Dr. L. A. YOUNG: Starch must be converted into glucose sugar. The reason I say crackers are injurious is because they must be converted before passing on, but the other is carried on before fermentation takes place. That is why I argue that starchy food is more injurious than sugar.

Dr. P. H. MORRISON: I think diet has more to do than lack of cleanliness in producing decay. I notice that in the lower walks of life, where the muscles of the body instead of the *chef* and the cook are used to triturate the food, the teeth are better than those of the West end people. I think if the latter had more plain corn bread and Indian cookery they would have better teeth. Any

organ that is but little used soon atrophies. If the teeth are used well they will be good whether they are taken care of or not.

Dr. E. S. CHISHOLM: I thought I would have something to fight over, but there has been a very little against it except in a few points, and in those I think we simply do not understand each other. In speaking of soda crackers being more detrimental than candies, you must understand that in speaking of candies I use a very broad meaning including any substance that may be converted into sugar. Even in the soda crackers the starch is converted into sugar and the principle is correct. When a cavity is formed, I will go farther back and say when there is a predisposition, produced sometimes by scarlet fever and so on, sometimes by irregularity, but whatever the cause if there is anything that will retain a substance of a saccharine quality, if only a piece of cotton, the acids that disintegrate the lime will be formed and the result will be decay. And while that may be true there may still be in the mouth alkaline secretion that will enter the meshes of the cotton or other substance that will retain it and so the decay is more rapid than in any other way.

Dr. YOUNG: Did I understand you to say that meat decomposes and produces decay?

Dr. CHISHOLM: Not meat; it is acids, but meat is a fibrous material that holds in its meshes those substances that produce acids. Candy does not produce decay but acids do. Dr. J. C. Chisholm thinks that the impurities of candies produce decay. We would ask what impurities produce the decay. We assume that. I do not think that candy in itself will produce decay.

It is said that clean teeth will not decay. That may be true, but we hardly know where that begins. There is hardly any such thing as absolute cleanliness. I assume that all acids will produce disintegration of the teeth and acids come from anything that is sweet. We may go back as far as to the time of Ezekiel where it is said that the fathers have eaten sour grapes and their children's teeth are set on edge. In regard to eating apples. There is no fruit that is nicer and healthier than apples and health is good for the teeth. The man who ate the apple every night would probably have had just as good teeth without the apple. If teeth are perfectly sound they are not liable to decay.

I want to make some other statements in regard to the micro-organic theory which is most prevalent. We have what might be

called predisposing and exciting causes of decay which may be designated as natural and hereditary. I can in no way in the world account for any microörganic creature that can move the hard enamel, but there may be something in Dr. Miller's idea. However, I maintain that they could not do it without the action of acids to soften and break the enamel and disintegrate the lime of the dentine.

Dr. J. C. CHISHOLM: In regard to eating candy, I have been asked what is in candy besides sugar. I do not believe the man is living that knows. It is like eating boarding house hash. The statement was made that by placing a bone in an oven it would break down by the heat. That was given as evidence that heat would break teeth, but even though that be true we do not use food hot enough to hurt the teeth unless there is a large filling, then we can feel its effect as heat expands and cold contracts metals. I just speak of that to carry out what I said about hot foods. I will reiterate that I do not think the sweets hurt the teeth, but it is what is in the candies, but what that is I do not think any man knows. I do not, but it causes a sickly child, a diseased stomach, loss of appetite and bad teeth, and it is along this line that candies work the mischief.

ABORTIVE TREATMENT OF CORYZA.—Lermoyez orders a snuff made of hydrochlorate of cocaine, 50 centigrams; menthol, 30 centigrams; salol 5 grams; boric acid 20 grams. A large pinch of this snuff, finely pulverized, every hour. Or a spray of a tepid and boiled solution of hydrochlorate of cocoain at 1 per cent every two or three hours. He also recommends a snuff powder, slightly antiseptic but not irritating, made of hydrochlorate of cocoain, 50 centigrams; menthol, 25 centigrams; salicylate of bismuth and sugar of milk, each 5 grams. Brand's method is to wet a piece of blotting paper every hour with 10 drops of the following mixture: Pure phenic acid and liquid ammonia, each 5 grams; alcohol at 90 degrees, 10 grams; aq. dest., 15 grams, and inhale it a few seconds.—*Gaz. Méd de Liège*, August 27.

THE DENTAL REVIEW.

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LATERAL MOVEMENT OF THE JAWS OF BEASTS OF PREY.

On page 582 July issue of the *Dental Cosmos*, Dr. Talbot, in discussing the paper of Dr. W. E. Walker on "Movements of the Mandibular Condyles and Dental Articulation," says: "* * * In visiting Dr. Bonwill the last summer, the jaws of animals, of which he has a considerable collection, were examined, and Dr. Talbot was convinced that the cuspid teeth of animals, usually supposed to be primarily for the purpose of holding their prey, served as a most important function as a guide in closing the jaws. *Beasts of prey, as we know, have much more lateral movement of the jaws than have men, and no matter how the jaws may close on the prey, the cusps of these come together and guide the jaws down to the natural position.* It is easily seen that if the jaws come together while they were tolerably extended apart, the prey would not be secured."

If we exclude the herbivora, what particular animals have "a greater lateral movement of the jaws than has man?" In watching a dog or a cat seize on its prey, or a wild boar, there is no discoverable lateral movement of the jaws. The teeth of such animals themselves would go to show that no such lateral movement as has man is possible during the act of mastication. In the mouths of beasts of prey, such as the lion, tiger, and others of the felidæ, the crowns of the teeth are so formed in the molar group that lateral movements of the jaws are impossible. The shape of the glenoid cavity will also prevent such lateral movements as may be seen by examining even the jaws of the black bear, which subsists on a mixed diet, as well as some others of the mammalian group.

There are so many beasts of prey of the order mammalia that we are at a loss to understand just what series of carnivora, or even those having a mixed diet, are possessed of lateral movements of the jaws. The cuspids or canines in the dentition of the female of savage beasts are generally rudimentary, or of such small size that the cusps of these teeth fail to "act as a guide in closing the jaws." Indeed, the more we study this very interesting subject of the lateral movement of the jaws in its relation to degeneracy, the more are we convinced that primal data on the habits, customs and general characteristics of man and animals is to be sought for before a beautiful theory is builded on uncertain foundations.

DENTAL JOURNALISM FROM A LAYMAN'S STANDPOINT.

In this issue we publish a paper and discussion on the above subject. No doubt the views of the layman, the man who reads our journals is the most valuable, and the improvements made in dental journalism are encouraged principally by his suggestions. There is no question but that there is room for improvement, and this improvement must be in the line of: 1, a selection of the best that is written by the best writers of the profession; 2, a condensation of this material in such a form that the busiest practitioner may have time to read it, and be benefited by it, and 3, sufficient frequent publication not to make the matter from month to month, or quarter to quarter, or week to week, which is better, too burdensome. No doubt a number of the dental journals are aiming to supply all these wants, and undoubtedly in the course of time the improvement will be more and more marked. Certainly at the present time a comparison of our literature with that of other professions shows a favorable condition of it. Notwithstanding the age and prestige of medical journalism, any reader of medical journals, will find, with few exceptions, that the publications of that profession cannot be favorably compared with dental periodical literature. The same repetition and republication about which there is so much complaint as regards our journals will at be once apparent. The publications devoted to the legal profession are usually of a character looking to the compilation of legal decisions, the digests of the acts of judges and courts, and are hence more in the form of the gathering of news matter. The judgment of editors of legal publications is not essential to the extent of that of a

dental editor, who must choose from practice and theory the best that is offered. Taking it all in all, therefore, while admitting that there is much room for improvement, we feel that the average layman will agree with us when we say that with all our faults there is yet much to commend in the high position which dental literature of to-day commands.

A CARD.

CHICAGO, October 14, 1896.

Dear Sir: I wish to announce through the medium of the REVIEW that after January 1, 1897, I shall not consider myself bound to pay a certain percentage to the dentist or physician who refers cases to me; except for those cases whose treatment may have commenced before the above date.

Dentists who desire a percentage in the future will make special arrangements in each case, and, as heretofore, will be considered as consulting dentist, to whom the case may be referred at any time for temporary treatment.

Respectfully,

C. S. CASE.

THE OPENING OF DENTAL SCHOOLS.

By the time this issue of the DENTAL REVIEW reaches the reader nearly all of the dental schools in this country will be open. When times are stringent all professional schools are filled to overflowing, so we may look for large classes this winter. It is hoped that most, if not all of the pupils, are possessed of a good preliminary education, as the profession is somewhat clogged by the number of illiterates in its ranks, and it is high time that matriculates should be gleaned from a better class of men, educationally, morally and socially.

The State boards are gradually lessening the number to whom licenses are issued as far as possible on an educational basis. If a system of registration of students could become universal in the United States the professional status would be immensely superior to what it is now. We hope much for the raising of the standard from the work done at Saratoga by the association of faculties, much of which will not be effective until 1900.

WHAT ARE YOU THINKING ABOUT?

The autumn days are here, golf playing is done for the summer and other forms of outdoor sports are ended and the winter is coming on. Are you spending all your time in frivolous amusements or are you thinking of writing a paper on drug poisoning, or septicæmia, or intestinal antisepsis, or poisoning by mercury in amalgam fillings, or tumors, or tetanus, or mummification, or emetics, or lateral motion of the jaw, or life insurance in its relation to dentistry, or recurrence of caries, or spasms, or aluminum plates, or platinum tipped crowns, or how to run a dental journal, or filling roots, or mouth washes, or planting teeth, or necrosis, or blind abscess, or cataphoresis, or capping pulps, or tin and gold, or anchoring fillings, or gangrene, or the maxillary sinus, or bacteria, or how to conduct a dental society, or when to use chloroform, or ethics, or how to obtain a practice, or how to prevent dark joints between gum sections, or how to tie the descending palatine artery, or what to do in case of poisoning with aconite, arsenic, zinc or opium, or when to cap abraded teeth, or treatment of incipient caries, or when to extract teeth for pregnant women, or how to administer nitrous oxide, or syncope—how to treat it, or abscess of the antrum, or the constitutional treatment of pericementitis, or what to read, or—what are you thinking about?

THE OTHER SIDE.

The disputatious speaker in the dental society only sees his own side of the case—not allowing his opponent the benefit of doubt. If he were an exact observer he might quietly state his case and leave the audience to judge of the correctness of his views. Audiences are sometimes only partial judges from lack of knowledge, from lack of sympathy with an unmagnetic speaker and from lack of interest in the subject. The terse, unambiguous speaker—with animation—is the one who holds the audience. Long-winded orators in professional societies are not much heeded—indeed, not wanted. If you have a thing of importance to utter, utter it clearly, distinctly—do not mumble it. We like to hear both sides—fairly and squarely—no sophistry—just clear, clean, understandable English, or whatever other language you speak. Do not guess at a thing—do not draw a long bow; tell what you know and let the other side take care of itself—it helps you best when it is

weak, illogical, unfriendly, unscientific, unworthy of belief. Be sure that you are *not* on the other side; always try to get on the right side—the growing side of a subject; an investigation, means preparation. Be prepared for emergencies.

REVIEWS AND ABSTRACTS.

SALIVARY CALCULI.* By G. FUTTERER, M. D., Chicago. Professor of Physical Diagnosis, Chicago Policlinic; Member of the Chicago Academy of Medicine.

Foreign bodies which enter the mouth with the food, or in a more accidental manner, may become the cause and the nuclei of salivary calculi. This has been found true in a comparatively small number of cases. Extraneous materials present in the oral cavity, breaking loose and entering the ducts, may have the same effect. I refer to fragments of decayed teeth, especially tartar. Small pieces of tartar often break down and can very easily enter the ducts, especially Wharton's duct. Here we find the most calculi, which are of very rare occurrence indeed in Steno's duct. Gravitation will bring the pieces down to the bottom of the mouth rather than up to Steno's duct; they will also remain there longer and occasion to enter will offer itself more readily. The lower incisors are places of predilection for the formation of layers of tartar, which here project as plates over the margin of the gums and easily break down.

Bacteria, especially *leptothrix buccalis*, may give rise to the formation of a calculus. Bacteria have so far, according to my knowledge, not been found in salivary calculi, and I have not found them in my cases; but that is of little importance, since a mustard seed has disappeared, and tubercle bacilli seemingly disappear in old fibrous and calcified tubercles, and if the length of time needed for the formation of a stone be remembered. A certain disposition for calcareous depositions is indicated by the case of calculous in Wharton's duct of Wyatt, by that of Pratt, in which calcareous concretions were coughed up, and also by my own case, in which the patient had an enlarged gall bladder and had suffered from occasional attacks of gallstone colic.

I have reviewed forty-five cases of calculus in the duct of the

*Application Thesis, Chicago Academy of Medicine Abstract.

submaxillary gland, nine cases from the submaxillary gland, four cases of calculi which seem to have occurred in the sublingual gland, and four in its ducts. So the calculi are chiefly found in Wharton's duct, while they are very rare in the submaxillary gland, and in the sublingual gland and its ducts. Only a few cases of calculi have been found and reported in the parotid and Steno's duct in man, while a great many have been reported in animals. If to our number of cases (sixty-seven) we add the ninety-three reports which we did not have at our disposal, the number of salivary calculi reported would sum up 160, and bearing in mind that these are the cases reported from the thirteenth century up to date, we must come to the conclusion that salivary calculi in human beings are of rare occurrence, even if we grant that there may have been cases in which the nature of the trouble was not recognized and other cases which have never been published. Concretions were found in only three cases, by Virchow, Closmadeux and Malenfant, and they all occurred in Wharton's duct.

Men are affected about ten times as frequently as women. The earliest age at which the symptoms have appeared was twelve years, and twice we find the age of seventy reported as the time of operation and relief ; but from the twentieth to the fortieth year is the preferred time of life. One calculus was found in forty-five cases, ten calculi in one case, and a great many in one case. The symptoms of calculi of the submaxillary gland and duct may be classified as follows :

Symptoms of the initial stage: Only in one case was this stage well marked by severe pain, caused by the entering of a mustard seed (Roberts) which then led to the formation of a calculus.

Symptoms of the stage of formation of a stone and of its growth: This stage may be passed through without any noticeable symptoms arising. Bruce reports a case in which a calculus existed for fourteen years without causing much inconvenience. Most patients on eating, especially if the diet be particularly tempting (Elston), will suddenly notice a swelling in the submaxillary region which, according to its degree, may be more or less painful. On resting the mouth and pressing in the swelling the latter will disappear. Such swellings will also come and go with colds (Lister, Roberts) ; they appear in the submaxillary region,

are of a hard consistency and are also to be seen and felt on the floor of the mouth between the jaw and tongue, pressing the latter upward and somewhat to the other side. In one of Hulke's cases the swelling seemed so firmly grown onto the hyoid bone that it was taken to be a fibroid. If the calculus be lodged in Wharton's duct it can often be felt by the patient or the physician. Alston's patient complained of being unable to eat, of feeling a weight and of having a rock in her mouth; while a patient of Freudenberg had noticed a calculus which projected and could be seen close behind the right *caruncula salivaris*. The voice also may be affected. Clark, in speaking of a patient, says: His voice, which had been harsh and coarse, after the removal of the stone became flexible and resonant. Severe attacks of toothache, caused by the presence of a calculus, have also been observed at this stage. Lister reports vertigo lasting from spring until August. Elston says: "The sympathy existing between the nerves of smell and taste was in my case most beautifully illustrated, for, according to the patient's account, he could never pass a savory smell without feeling a sudden enlargement of the submaxillary gland, and pain, and he said he had dined but a few days previous to my seeing him on a meal which always used to make his mouth water, but which in this instance, in consequence of the outlet of the duct being completely closed, had produced so violent a distention of the gland as at once to set up such a degree of active inflammation as shortly after led to the discovery of the nature of the disease."

Symptoms of the stage of suppuration: Suppuration prepared for the expulsion of the stone, which in many cases is brought about by way of the duct or by way of a fistula, I find three cases reported, in one of which Nelaton extracted a calculus through a fistula. Such a suppuration may come suddenly, causing considerable swelling of the gland and the surrounding parts, great difficulty in swallowing and in mastication, impaired speech (Bonavert), facial pains (Rouyer), attacks of suffocation (Lister, Jessup), and, in Oliver's case, the opening of the mouth was prevented by the painful swelling. In short, this stage brings quite a variety of symptoms and a great deal of suffering to the patient who soon seeks relief. The stage of suppuration may, however, come and go several times, or it may become extremely chronic, as in Terrier's case, where chronic swelling and discharge of pus lasted for a long time.

Symptoms of calculi in the sublingual gland and its ducts: Immisch (1891) considers the formation of calculi in the sublingual ducts improbable. Michel (1867) reported a case, which I have already mentioned, in which a fishbone had pierced a sublingual duct and then a stone had formed. In a case, hereafter to be reported, there was no difficulty in swallowing, but great difficulty in mastication; much swelling in the mouth, but very little to be seen in the submaxillary region. While there may have been some slight compression of Wharton's duct, the stone could not have been lodged there, but must have been in the sublingual gland or one of its ducts; judging from the shape of the stone and from the fact that it could be felt, I should say it was in a duct. As by far the most calculi are found in the ducts, the symptoms, together with the results of palpation and careful probing, will throw light on the case; the probing Lecomtes especially useful if a calculus be located in the gland where it cannot be felt by palpation.

Modes of procedure for removing calculi: Bonavert (1889) sent his man to the patient and bade him tell him to try and break it (the tumor) with his finger, "which the man effected." J. W. Hulke (1872) made his way to an abscess cavity in the submaxillary gland from the outside, trying the facial artery. All other operators have opened the abscess wherever they found it, or proceeded by way of the duct, cutting it open. Fenger anæsthetized his patient, cut the duct and sewed it up again, while Marshall cut the duct and then dilated its lower portion with a slippery elm tent. In sixty-seven cases, five single relapses occurred, while in another case three relapses were reported occurring in the course of twenty years. In one of these cases the calculus is said to have grown within a year, but I would rather believe it to have been already present when the other calculus was removed. Calculi have very probably been left in some of the other cases also, and it seems as if relapses were very rare, so that we may consider the prognosis to be good if at the time of operation all calculi present be removed. Other bad consequences, such as stenosis, etc., I have not found recorded.

The calculi reported measure up to 6 centimeters in length and $5\frac{1}{2}$ centimeters in width, and they have been found to weigh up to 18 grammes (270 grains). Their form is more or less cylindrical, oval or round, or more spindle shaped. The surface has been found smooth but usually it is somewhat uneven, very

finely granulated, or warty. The color is generally a grayish white or a yellowish white, but it may also be brownish. The consistency is either hard or fragile. The cut surface is generally lamellated. Virchow, on examining microscopical cuts, found a regular formation of homogeneous lamellæ and granular portions of yellowish green color. In my own case the large calculus is only lamellated in its peripheral portions, while the central part shows an irregular configuration. This stone is from the gland itself, while the two others in the original cases reported were from the ducts and lamellated throughout. The specific gravity differs very much. Chemical examinations always show the presence of lime phosphate and sometimes lime carbonate. According to nationality, I have found reported 72 cases from France, 34 from Germany, 25 from England, Canada and Australia; 12 from America, 4 from Italy, and the others from different other countries. France has had by far the most cases, but I am at a loss even to guess why this is so.

A few months ago I extracted two calculi from a submaxillary gland, and, as such calculi are very rare occurrences, I thought it well to report the case. Dr. Christian Fenger then favored me by putting at my disposal a calculus which he had removed from Wharton's duct, and Dr. W. P. Verity kindly gave me another which he had taken away either from a sublingual gland or from one of its ducts.

Case 1. Submaxillary calculi: Mr. M., thirty-four years of age, about four years ago while eating noticed the appearance of a swelling under the jaw on the left side. A moment's pressure of his finger on the swelling caused it to disappear. This occurred several times. Three years ago this spring he noticed a similar swelling, which, however, became enlarged and painful; pressing had no effect. A physician was called, who prescribed poultices and leeches, and after a week the swelling gradually disappeared. After about six months the same trouble came again, but this time it did not yield to treatment as readily as before. After about another six months it again made its appearance, and was more stubborn than ever. Altogether, the patient had suffered from such attacks four or five times when he called upon me. I found him a tall, slender, somewhat anæmic man, with a "weak" stomach and an enlarged gall bladder. He had suffered from several attacks of gallstone colic; he complained of pain in the left submaxillary

region and some difficulty in swallowing. The left submaxillary region was swollen; there was a swelling on the floor of the mouth along Wharton's duct, and on pressing of the submaxillary gland, pus of a greenish color escaped from the orifice of Wharton's duct on the left side. A calculus could not be felt, but the frequent attacks on the same side in the course of years, together with the fact that the patient had never suffered from tonsilitis, pharyngitis or stomatitis, suggested the idea that a calculus might be the cause. Dr. John S. Marshall was called on for surgical aid, who passed a small silver probe into the duct and discerned at a depth of seven centimeters from the cutting edge of the inferior central incisor tooth a hard body, which led to the belief that a calculus was present in the gland. He then cut open the upper third of the duct and introduced an especially prepared slippery elm tent, intending to remove the tent after a lapse of forty-eight hours and look for a calculus.

In the course of the next night swelling and pains increased considerably, involving the left side of the face and neck and the whole tongue, compelling me to remove the tent after it had been in position for twenty-four hours. The removal of the tent was followed by a gush of about an ounce and a half of saliva and greenish pus. On passing a probe we felt a calculus deep down in the gland. Dr. Marshall then with a grooved bistoury laid open the duct throughout its entire length. The incision measured about two centimeters at the surface of the floor of the mouth, but probably not more than one centimeter at the level of the calculus. This, however, did not enable him to take hold of the calculus and extract it. My own attempts in the same direction also failed. We, therefore, packed the incision to further dilate the duct and made another attempt the following day. The next morning after removing the packing and washing the gland thoroughly with a 5 per cent solution of carbolic acid and then with hydrogen peroxide through a rubber catheter, I succeeded in removing a small faceted calculus of a yellowish color, weighing 1 grain. On the same evening I removed another calculus, also of a yellowish color, weighing 24 grains. A thorough probing of the cavity convinced me that no more calculi were present, but for certainty I introduced a urethral electroscope, and, as the bed of the concretions was in the upper posterior portion of the gland, I had no difficulty in submitting the parts to ocular inspection. If the

thought of using the electroscope had suggested itself to me sooner, I could have easily ascertained the size, shape and position of the calculi, and thus materially facilitated extraction. During the following two weeks the cavity was cleaned twice a day, and after each cleaning the duct was loosely packed with gauze to prevent foreign bodies from entering. Later on, when the duct grew smaller, a silver tube was introduced and allowed to remain. Twice this tube was changed for a smaller one, and now the patient wears one that has about the diameter of a normal duct. All those tubes I fastened to the incisor teeth with silver wire. Dr. J. A. Wesener, who made the chemical examination, reports as follows: "Specific gravity 1.584. It is composed of calcium sodium and potassium acid phosphate, with a trace of xanthine and iron. Tests for ptyalin, potassium, sulphocyanide fats, fatty acids, carbon dioxide, magnesium, and inorganic acids, negative." The microscopical examination (Futterer) gave no particular results.

Case 2. Calculus from Wharton's duct. The following history was kindly given me by Dr. Chr. Fenger, who observed the case: Mrs. X., fifty years of age, on partaking of sour food, would occasionally notice a little lump arising in the right submaxillary region, accompanied with some pain. In half an hour the lump would disappear and would not return for two or three months. So it ran along for years. The patient never had any sore throat or stomatitis until about two months before the operation, which was performed on the twenty-first of January, 1895. The lump, however, had been continuously present for some time, the submaxillary swelling tender, and the throat and right half of the floor of the mouth sore. Swallowing was painful all the time and she had been gargling with listerine since the latter part of November to cure what she considered to be a sore throat. Sometimes, when she sat down to a meal, the lump would assert itself very suddenly with a kind of dull pain, which would continue for fifteen or twenty minutes, sometimes an hour, or even, on rare occasions, an hour and a half. Then the swelling would disappear spontaneously. She never noticed that any fluid came into her mouth, or that she had to spit. The swelling simply disappeared. When the swelling was present there would be a sensation of pain and distress in swallowing.

Under anæsthesia the duct was opened for three-quarters of an inch; with forceps a stone was removed from behind and below

the posterior border of the mylo-hyoid muscle. The cavity was about two centimeters long and one centimeter wide. The duct was found dilated. The cut portion was united and healed almost entirely by first intention. After healing, a probe was passed freely from an opening close to the papilla to the posterior part of the duct, where an opening into the mouth remained, through which saliva or clear mucoid fluid could be squeezed up by the pressure on the gland. Ten days after the first operation Fenger (without an anæsthetic) closed this opening by sutures. After three weeks it was closed permanently.

An examination, made April 18, 1896, showed that the patient had remained perfectly well; sublingual and submaxillary glands normal also. Wharton's duct, no opening at posterior border of mylo-hyoid muscle; a probe could be passed through a small opening two millimeters outside of the papilla for a distance of two or three centimeters; duct not dilated. Chemical examination: Specific gravity, 2.306. Stone composed of calcium sodium and potassium acid phosphate, with a trace of iron and uric acid.

Case 3. Calculus from a duct of the sublingual gland. Dr. W. P. Verity gives me particulars of a remarkable case. His patient was a woman, aged forty. At the age of twelve she began to feel a swelling at the left side of the floor of the mouth, which would come and go and which interfered with mastication, but not with swallowing. Twenty-eight years later the swelling had increased so that it lifted up the tongue and pressed it over the right side. Interference with mastication increased, but there was no difficulty in swallowing. A calculus could be felt about $1\frac{1}{2}$ inch from the caruncula salivaris. Dr. Verity cut into the mass; pus was evacuated, and with it a calculus. The calculus was of cylindrical shape, the end rounded off, flattened on one side of its longest diameter so that a cross section would show a warty, plano-convex shape surface; color grayish white and consistency hard.—*Medical Standard.*

RHYMES OF THE STATES. By GARRETT NEWKIRK, with drawings by Harry Fenn, after sketches by the author. New York: The Century Co. 1896.

This very handsome book for children (and those of larger growth) is from the pen of one of our own profession. Dr. Newkirk has long been an honored member of the dental ranks, and to find him working in other fields as the children's

friend is indeed a pleasure. We were filled with amazement at the array of figures piled up in such an innocent manner before the little learner. By the time the rhymes are committed to memory the whole history of the whole country will be at the tongue's end. There is much method in the work of the author, and he has our very best thanks for the production of such a book. We have tried it on our own children, and, like the boy in the picture, they are crying for more. The illustrations and text are in every way admirable, and the author is to blame for all the rest and comfort that parents can get when the children are not singing his rhymes.

NOTES ON THE HISTORY OF ANÆSTHESIA. The Wells Memorial Celebration at Hartford, 1894. Early record of Dentists in Connecticut. By JAMES McMANUS, D. D. S., Hartford. Printed by Clark & Smith, 1896. Edition limited to 200 copies. Compliments of James McManus.

This publication of one hundred and sixteen pages, dedicated to the son of Horace Wells, on October 1, 1896, is printed on splendid paper and contains a reproduction of the Wells Memorial tablet, which was unveiled in Hartford, Connecticut, December 11, 1894. Its contents are a valuable addition to our history, and at least so far as the State of Connecticut is concerned, the future historian will always be grateful to Dr. McManus for the thoughtfulness and the care exhibited in recording the history of the profession of his native State. It contains, as the title page indicates, a chapter on the history of anæsthesia, covering a period from the first suggestion of anæsthetics at about the commencement of the Christian era to its final culmination in Hartford, Connecticut, December 11, 1844. The next chapter records the memorial celebration held in Hartford, December 10 and 11, 1894. As many of those present at that celebration were personally familiar with the history of the discovery, this report is a very valuable contribution to literature. The third and last chapter contains the record of dentists of the early days of Connecticut, recording the lives and works of the members of our profession from 1800 to the present time. If it is borne in mind that many of our most worthy and able men have either found in Connecticut their birthplace or that their lot has been cast in that State to do their life work, we will recognize the historic value of these records, which must have been collected and compiled at the expense of considerable time and money by Dr. McManus.

LOUIS OTTOFY.

MEMORANDA.

Dr. D. N. McQuillen has returned from Europe.

The *Bur* is out for October and is very newsy and sharp cutting.

Dr. D. C. Smith, of Stauffville, Ontario, spent a few days in Chicago recently.

More than \$4,000 has been subscribed for the widow and children of the lamented P. Dubois.

He said: "My doctor thinks I am suffering from anno domini." "What," says his friend. "Old age," says he.

Silico fluoride sod. saturated solution and boric acid saturated solution; inject around roots when root or neck is sensitive.

Dr. Geo. S. Nason has accepted the chair of Prosthetic Dentistry in the dental department of the University of Omaha.

The National Congress of Dentists of France was held at Nancy in August last. The next meeting will be held in Lyons in August, 1897.

Dr. Carl T. Gramm will deliver a course of lectures on stomatology this winter in the Keokuk Medical College, College of Physicians and Surgeons.

Dentists who reside in the district adjacent to Elgin and others are invited to be present at the meeting of the Northern Illinois Dental Society, Oct. 21 and 22.

Dr. C. R. Taylor, of Streator, Ills., President of the State Dental Society, delivered an address at the opening of the college lecture course in the Chicago College.

A little girl was asked "Which are the first teeth?" She replied, "Baby teeth." "Which are the last teeth?" "False teeth." Climax. (From the French).

Dr. W. W. Walker having secured several novelties in Europe, will exhibit them in New York this winter before the numerous societies of which he is a member.

Dr. R. B. Tuller is the author of the campaign song "Hurrah for the Major;" also of the gentle refrain, "Jostle, jostle, jostle." which is so deservedly popular.

Herbst's needles for retaining the dam above or below labial cavities are described in the October issue of the *British Journal of Dental Science* by Mr. W. R. Humby.

Galangal root is used to destroy the taste for tobacco. A morsel placed in the mouth causes a flow of saliva and a gentle warmth is imparted to the mucous membrane which is very grateful to the habitual tobacco user.

M. Chas. Godon is the director of *L'Odontologie* and Dr. Maurice Roy is the editor in chief. Every day in the week some one of the committee attends for one hour to meet friends and contributors at 57 Rue Rochechouart.

Dr. L. J. Mitchell, of London, was entertained at dinner at the "St. Hubert" Monday, September 21, by the following gentlemen; Dr. A. W. Harlan, Dr. J. W. Wassall, Dr. L. L. Davis, Dr. E. A. Royce, Dr. Louis Ottofy, Dr. T. W. Brophy, Dr. C. S. Case, Dr. E. L. Kern. A very pleasant evening was spent in talking over old times. Dr. Mitchell sailed for home September 30.

ILLINOIS STATE BOARD OF DENTAL EXAMINERS.

The annual meeting was held in Springfield, September 29, 1896. Fifteen candidates for license were examined. Officers were elected for the ensuing year as follows: President, A. W. Harlan, Chicago; Secretary and Treasurer, L. L. Davis, Chicago. Next meeting to be held the last of March in Chicago.

HAIR WASH.

Soap, genuine castile, 1 ounce; soap bark, 1 ounce; glycerine, alcohol, of each 2 ounces; carbonate of potassium, 120 grains; oil of almonds, 80 grains; water, a sufficient quantity to make 1 pound. Dissolve the soap in sufficient water by means of heat, add the soap bark and the other ingredients, cork, and let stand for several days, and then filter.

COLOGNE.

Mix together in stated proportion the following essential oils: Lavender, bergamot, orange, lemon, petit grain, of each 600 grains; rose; nutmeg, of each 25 grains; rosemary, rose geranium, of each 30 grains; orange flower water, triple distilled, 30 ounces; cologne spirits, $4\frac{1}{2}$ gallons; water, a sufficient quantity to make 5 gallons. Let stand one month, and filter.

The Royal College of Dental Surgeons of Ontario, held the formal opening of their new college building, at 9 Avenue Street, Toronto, on Thursday, October 1, 1896, his honor, the Lieut-Governor of Ontario officiating. The following programme was carried out: Prayer by Rev. Principal Caven; "Review of Dentistry in Ontario," by Dr. J. B. Willmott; Building Committee Report by Dr. H. T. Wood, Chairman; Address by Hon. G. W. Ross, LL. D., Minister of Education; Address by Prof. Thomas Fillebrown, Dental Department, Harvard University; Address by His Honor G. A. Kirkpatrick, LL.D., Lieut. Governor of Ontario.

Programme of the ninth annual meeting of the Northern Illinois Dental Society, which will be held at Elgin, Wednesday and Thursday, October 21 and 22, 1896. Essays and Discussion: Annual Address by the President, Dr. H. C. Gill, Rockford; "Cataphoresis," Dr. W. B. Ames, Chicago; "Prosthetic Dentistry of To-day," Dr. E. H. Allen, Freeport; "Preparation of Cavities in Molar Teeth and Consideration of Different Filling Materials," Dr. Chas. J. Sowle, Rockford; "Some of the Preliminary Steps of Importance in Operative Dentistry," Dr. Garrett Newkirk; "Operative Dentistry," Dr. Louis Ottofy, Chicago; "A Few Suggestions," Dr. J. H. Woolley, Chicago; "The Illinois Dental Law," Dr. W. J. Phillips, Elgin; "Systemic Medication," Dr. E. L. Clifford.

Clinics: "Surgical Case," Dr. T. W. Brophy, Chicago; "Porcelain Work," Dr. W. H. Taggart, Chicago; "Bleaching a Tooth with 25 per cent Pyrozone," Dr. E. H. Allen, Freeport; "Obtunding Sensitive Dentine by Cataphoresis," Dr. J. H. Woolley, Chicago; "Gold Filling," Dr. M. L. Hanaford, Rockford.

"Clinic," Dr. J. P. Carmichael, Milwaukee; "Flexible Edged Rubber Plate," Dr. W. B. Ames, Chicago; "Porcelain Faced Bicuspid, All Soldering done with Bunsen Burner, No Investment," Dr. A. H. Peck, Chicago; "Preparation of Roots and Setting Logan Crowns," Dr. Chas. J. Sowle, Rockford.

ANTIDOTES TO CARBOLIC ACID.

The writer of an article in the *Semaine Medicale* states that, according to Professor Carleton, vinegar is an antidote to carbolic acid. When it is applied to the skin or mucous membrane which has been burned by the acid, it causes rapid disappearance of the characteristic whiteness, as well as of the anæsthesia produced by carbolic acid, and also prevents the formation of a slough. Moreover, it neutralizes any of the acid that may have been introduced into the stomach. In cases where carbolic acid has been swallowed, the patient should first be made to drink some vinegar mixed with equal parts of water, and then the stomach should be washed out.

B. Frazer (Can. Med. Rec.) reports a case where a woman, attempting suicide, after experimenting with mixtures of carbolic acid and beer, took a large quantity of equal parts of alcohol and carbolic acid. It did not have a corrosive action on the mucous membranes; a condition of unconsciousness existed for eight hours, vomiting for twenty-four hours, and then rapid convalescence. Locally, also, alcohol counteracts the corrosive action of carbolic acid; if the alcohol is applied continuously, until heat causes to be developed in the pad soaked with alcohol applied to the burn, the pain and staining disappear.

Here is a corker. The *Nursing World* publishes the following under the misnomer "Care of the Teeth." It is impossible to estimate the injury such rubbish must cause in homes where children are raised:

"Rinse mouth several times daily with water, to which add either myrrh, claret, common salt, aromatic vinegar, eau-de-cologne, etc.

"A half ounce of listerine to a glass of water, used ad libitum, is excellent; so is boric acid solution, especially after milk diet, to prevent decomposition of particles remaining in the mouth.

"Equal parts lemon juice, glycerine and water make an excellent wash; glycerine is soothing, and lemon juice stimulates secretion of saliva, and is, therefore, grateful in modifying dryness caused by opium or its alkaloids.

"The following is sometimes recommended:

R Chlorate of potash.....	..... ½ drachm
Borax.....	..... 1 drachm
Listerine.....	..... 1 ounce
Water to make.....	..... 2 ounces.

"Add one teaspoonful to a glass of water.

"Use swab or cloth for applying washes to mouth and teeth, and cleanse tongue with soft toothbrush with bristles cut short.

"For sores in the mouth, apply boric acid, or borax and glycerine, (not honey, as it may decompose).

"For decayed teeth or bleeding gums, rub between lips and gums, powdered boric acid, twice daily.

"Remove false teeth and cleanse with listerine or saturated solution boric acid; deposits on plate scour off with prepared chalk.

"Anoint lips, and if cracked apply boric acid, powdered, or carbolized vaseline." Whew!

THE DENTAL REVIEW.

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ORIGINAL COMMUNICATIONS.

THE DENSITY OF THE TEETH AND ITS RELATION TO CARIES.*

BY C. N. JOHNSON, L. D. S., D. D. S., CHICAGO, ILL.

In the May, 1895, issue of the *Dental Cosmos*, Dr. G. V. Black began the publication of a series of articles entitled "An Investigation of the Physical Characters of the Human Teeth in Relation to their Diseases, and to Practical Dental Operations, Together with the Physical Characters of Filling Materials."

This was the first really systematic and scientific effort made to determine the varying density in the teeth of different individuals or of different teeth in the same individual. Previous to this it seemed to be the generally accepted opinion of the profession that this variation was pronounced, and in many instances very great. The expressions, "hard teeth," "soft teeth," "dense teeth," "chalky teeth," etc., were frequently found in the literature of the profession, and this was supposed to refer to teeth having a greater or lesser percentage of lime salts. The density of the teeth was also believed to have a marked influence upon the liability of teeth to decay, and it was largely taken into account by many operators in the selection of a filling material.

Dr. Black finally became dissatisfied with our lack of exact knowledge of the subject, and instituted a series of painstaking and elaborate experiments to determine the true density and relative strength of the different teeth. In following out this most exhaustive work he spared nothing in the way of time, labor or expense to arrive at definite and conclusive results. It gives me

*Read before the Odontological Society, October 20, 1896.

pleasure at this time to testify to his unceasing attention to the minutiae in every phase of the work. It was my good fortune to visit him in his laboratory during the progress of the experiments, and to witness the process to which he subjected every specimen in his records. That visit impressed me with the conviction that I had never till then witnessed true scientific investigation, and made me morally certain that so far as human agency could insure infallible results, the issue of Dr. Black's findings must be final.

This series of experiments proved conclusively that the generally accepted idea of the profession in this matter was at variance with the facts. Dr. Black found that at most there is very little difference in the percentage of lime salts in the teeth of different individuals. In fact, to use his own words, "There is a difference between the individual teeth of the same person that is much greater than the difference in averages of the teeth of different persons."

It has seemed to be very difficult for the profession to follow Dr. Black's investigations, or to see the significance of what he has demonstrated. Probably only a very small percentage of the profession are in the habit of reading papers of this nature, and even among those who do, it is asking much to expect them to at once renounce their preconceived notions, and fall in with a wholly different point of view. More especially is this true if their original ideas have been formed from an extended clinical observation. Men are inclined to cling tenaciously to what they believe their experience has taught them, even when confronted with facts which prove their ideas to be faulty. In this, as in many other things, clinical observation is not altogether reliable; and yet the profession goes on basing its opinion largely on what it thinks it sees.

In any event we still find in our periodicals frequent references to "hard teeth," "frail teeth," "soft teeth," etc., relating to the supposed varying degrees of density, and we also see certain kinds of filling material advocated for certain kinds of teeth. In the light of Dr. Black's investigations, such references are misleading, and such reasoning erroneous. There is very little difference in the structure of human teeth, so far at least as the percentage of lime salts is concerned, and there are no teeth of so poor a structural quality that they are unsuited for the reception of any of our hardest filling materials. Other things may materially influence

our selection of a filling material, but the structure of the teeth has little to do with the question.

In this connection it may be well to consider a point that has seemed to lead to some confusion of understanding. The question arises as to what is really meant by the average practitioner when he says "hard teeth," or "soft teeth." Dr. Black once asked me what kind of an answer I should expect to get from members of the profession generally if asked what meaning they intended to convey by these terms. I said, "I should expect them to answer that by 'hard teeth,' they meant teeth that offered great resistance to cutting instruments, teeth that were difficult to break down with a chisel or pierce with a bur or drill." Said he, "You are mistaken. I have asked many of them and they almost invariably answer that by 'hard teeth' they mean teeth that do not decay readily, and by 'soft teeth' they mean teeth that are easily attacked by caries and break down rapidly under its influence."

It would seem to the observant operator that at best this form of argument was reasoning from effect to cause instead of from cause to effect, and if this be the real opinion of the profession at large it is proof positive that they have not carefully considered the question. It has certainly been demonstrated beyond the shadow of a doubt that the density of a tooth has little to do with its liability to decay. That all teeth are not alike in structure, so far at least as certain phases of their physical character is concerned, must be admitted, but that this difference relates to any great variation in the percentage of lime salts or that it has anything to do with the carious process has been sufficiently disproved.

One fact has seemed to mislead many operators and cause them to look with doubt upon Dr. Black's conclusions. His first series of articles went to prove that the teeth were quite uniform in their density, that there was little variation in the percentage of lime salts, and that the expressions "soft teeth," etc., were misleading. Men read these statements and then proceeded to note as best they could in the mouth the physical character of the teeth to the end that they might verify or disprove what Dr. Black had written. The thing that struck many of them immediately was the appreciable difference in teeth in their power to resist cutting instruments. That this difference does exist seems scarcely to be doubted; it has been noted by too many operators who are not careless in their observations. This fact confused many of them

and led them to assume that there was some discrepancy between Dr. Black's findings and the actual facts.

When this question was brought to his notice Dr. Black hastened to state in a paper read before the New York Odontological Society, and published in the April, 1896, issue of the *Dental Cosmos*, that his investigations had not included this phase of the subject. He says: "Since the publication of my papers, I have been so frequently asked about differences in the hardness of the teeth to cutting instruments that I wish to say emphatically that there was no intention of saying anything whatever on that point in what I have written. Whenever hardness or softness of the teeth is mentioned, it has been with reference to the prevailing expression of hardness or softness as expressing the idea of more or less perfect calcification, or with reference to the ability of the dentine to withstand heavy pressure without crushing. It has not had reference to the behavior of the teeth before cutting instruments. I did try to investigate that point and tried a number of plans. None of them gave results that were satisfactory, or that I thought valuable. I will say here, however, that experimentally out of the mouth I was unable to find any marked difference between teeth classed as soft and teeth classed as hard, and the impression upon my mind is that much of the difference in the hardness of the teeth as found in operating in the mouth is a matter of position, direction of cutting, and opportunity. Still, however, I am finding in practice that which appears to be very considerable differences in the hardness of teeth to cutting instruments. I am persuaded that in many cases men have mistaken for normal dentine, dentine softened by partial solution of the lime salts."

In discussing this question subsequently with Dr. Black your essayist asked him upon what grounds he based his opinion that the apparent differences in resistance to cutting instruments was due to lack of opportunity. He replied that in his experience he had found that the angle at which the instrument was held influenced largely the ease or difficulty with which the tooth tissue responded to it. For instance, in placing a chisel against a wall of enamel to break it down, it sometimes occurred that several hard blows of the mallet would be struck without apparently affecting the tooth tissue in the least, but that the moment the angle of the chisel was slightly changed the enamel gave way under it with little pressure.

This fact has, of course, been frequently noted by all observant operators, and yet it does not seem to account for the many variations we find in resistance to cutting instruments. It relates more particularly to the line of cleavage of enamel, and has principally to do with the direction of the enamel rods. But in the actual drilling into sound tooth tissue in the extension of cavities or opening out of fissures, there is a marked and a very emphatic variation in the degree of resistibility manifested by the different teeth. Given two teeth standing in precisely the same angle in the mouth, with equal facilities for approach, and the operator armed with drilling instruments of uniform keenness, one will be found to present a flint-like hardness that blunts the drills or burs discouragingly with little penetration into the tooth tissue, while the other will admit the drill with slight exertion and grind up almost like a piece of chalk. The recognition of this clearly demonstrated fact in Dr. Black's original series of articles, together with the explanation that it had no bearing on the question at issue, would have done much to disarm possible skepticism on the part of many observant operators.

But the main point of emphasis in the present paper relates to the supposed connection between the density of the teeth and the process of caries. That there is little or no relation between these two conditions seems demonstrated conclusively, and the sooner the profession awakens to a realization of this fact the better it will be for our patients. Thousands of useful teeth have in the past been consigned to the forceps on account of this fallacy, and thousands more will be unless the fallacy be recognized. Until the rank and file of the profession understand that decay of the teeth is a disease influenced by external conditions rather than by the inherent structure of the teeth they are not in a position to intelligently combat the trouble.

Let us assume a case for the purpose of illustrating the different lines of procedure in accordance with the different theories. One operator has presented to him a mouth in which decay of the teeth seems to be progressing rapidly. He believes from preconceived notions that the structure of the teeth is poor and that it is well-nigh useless to try to save them. He patches them up in a half-hearted sort of way and tells the patient that the teeth are soft and not likely to last long at best, and the patient feeling that the fight is all one way fails to take proper care of them. The result

is that new cavities are formed and recurrences of decay take place around the fillings. The operator attributes the failure of his work to the defective structure of the teeth, and the patient yields up the issue and has the teeth extracted. This is the history of many a case.

Another operator, recognizing the true significance of caries, takes his patient vigorously in hand, and proceeds on the theory that if the conditions surrounding the teeth can be controlled, the teeth themselves are of good enough structure to be saved. He impresses the patient with the importance of painstaking care of the teeth to the end that deleterious agents affecting them may be eradicated from the mouth. He lays great stress on cleanliness. Then he proceeds to his operations with great thoroughness, believing that he has in the teeth a sufficient structural foundation for permanent work, provided he can wall out the active agent of decay. He counsels his patient to apply frequently for examination of the teeth so that he may detect evidence of the disease in its early stages. In the very worst cases he keeps up a vigorous fight with the hope that the conditions in the mouth may change and modify the tendency to decay. And in many cases this very thing happens. We have all observed cases where the teeth have been decaying in a most discouraging manner for years despite our best efforts to combat the disease, when suddenly the mouth seems to become immune from caries and we are successful in ultimately saving the teeth. This immunity relates not to any structural change in the tooth tissue, but to a change in the conditions surrounding the teeth which renders the propagation or development of the microorganism of caries less favorable. We are never able to predict when such a change may occur, but the fact that it does occur should encourage us to make a supreme effort to save a patient's teeth even in the face of discouraging symptoms.

Just what is the nature of this change in condition we are unable with our present knowledge to indicate. If we could produce such a change by treatment, either local or general, we could go far toward preventing dental caries. And it remains for the future investigator to solve this problem. Dr. Black has indicated the lines on which a solution of the difficulty must be worked out, and in March, 1894, before his recent experiments in the physical characters of the teeth had been made, I had written in the DENTAL REVIEW, page 201, as follows: "We believe then that the problem

of preventing dental caries must be worked out along other lines (than mere local treatment), and we have a suggestion to make as to what these lines shall be. It would seem patent, in view of the foregoing, that if we are to accomplish anything permanent in this direction, we must so change the *conditions* of the mouth that the microörganism of dental decay cannot exist therein. To attempt this may seem utopian, and we are not unmindful of the difficulty of the problem, but we are convinced that this is the only certain way out of the dilemma.

“When we speak of changing the conditions we refer to something deeper and more subtle than a mere chemical reaction. There are agencies at work affecting the life forces of the human economy, the nature of which we to-day know comparatively little. We may recognize an idiosyncrasy, but we are not capable of defining the causes which lead up to it. For instance there are individuals in whose mouths caries is seldom or never seen, while there are others with teeth as well developed, and where even greater care is taken, who lose their teeth bit by bit despite the most persistent effort to save them. The logical conclusion seems to be that in the one case there is a subtle condition present in the mouth which militates against the active agency of the microörganism, while in the other the conditions are favorable to its development.

“At the present time we are wholly unable to distinguish between these two conditions—we can see only the results. But the time may come—and we trust it will—when we are able to recognize these conditions and treat the patient accordingly. The idea of vaccination for the prevention of dental caries would offer a most delightful topic for the newspaper humorist of to-day, and yet who knows what the future may develop? One thing seems certain—we must learn more than we now know regarding the conditions that are favorable or otherwise to the propagation of the microörganism of caries, and we must also learn how to modify these conditions before we can hope to successfully prevent decay of the teeth.”

THE MECHANICAL PERSISTENCY OF THE SPRING CONSIDERED
SCIENTIFICALLY.*

BY L. P. LEONARD, D. D. S., MINNEAPOLIS, MINN.

If, by force, matter is compressed, twisted or bent, upon cessation of the force the substance acted upon has a tendency to resume its original shape; which tendency might be called intrinsic life, mechanical persistency, elasticity or spring, and is possessed by a greater or less degree by all bodies.

Gases and metals possess this intrinsic life to a considerable degree, the former to perfection, the latter to a very great extent.

The atmosphere, if compressed, upon relaxation will completely resume its former relationship; metal, especially steel, will do so very nearly, but not completely. Hence a spring after long continued use is said to "become weak." The elasticity of æri-form bodies is largely taken advantage of to day by manufacturers for the inflation of pneumatic tires, face pieces, etc.; by physicians for the purpose of producing a fine medicated spray for treating nasal and tubercular disorders; by the dentist to obtain a continuous blast from the blowpipe and hot-air syringe and to produce the blow of the pneumatic mallet.

Let us now consider that lifelike principle, that elasticity or mechanical persistency of steel.

Before doing this, however, it might be well for us to draw a lesson from that which we are about to study. I care not whether we be in the vocation of dentistry, unveiling the mysterious, revealing the hidden, building bridges across the unused, regulating and beautifying the unsightly, or whether we be working in other vocations of life, that same persistent spirit, that same unyielding to things difficult, that same Napoleonic conquering as we march upward the path of science and of light, must ever be our precept and our motto. And when the cloud of discouragement comes, as come it does, let us be buoyed up by the thought that we should have at least the persistency of the inanimate—the spring.

We are inclined to look upon solids as lifeless, ultimate and unchangeable but to prove that things are not always as they seem and that even cold steel has mechanical life and properties which are subject to change, the following illustrations are cited:

The greatest range of movement of steel is obtained from

*Read before the Minnesota State Dental Association, 1896.

small rods, such as the piano wire and rectangular strips, such as the clock spring. Example 1. Piano wire is used in sea-sounding and when the weight is alternately applied and removed, the wire lengthens and shortens about $\frac{1}{86}$ th of its length, and shrinks and expands about $\frac{1}{8}$ th of its diameter.

Example 2. Eight different specimens tested by the gradual addition of more weight within ten minutes of time, in each case, until the wire broke, bore an average of 45 pounds just before breaking. Another specimen of the same wire was put up with the weight of 40 pounds hanging on it on the 5th of July; on the

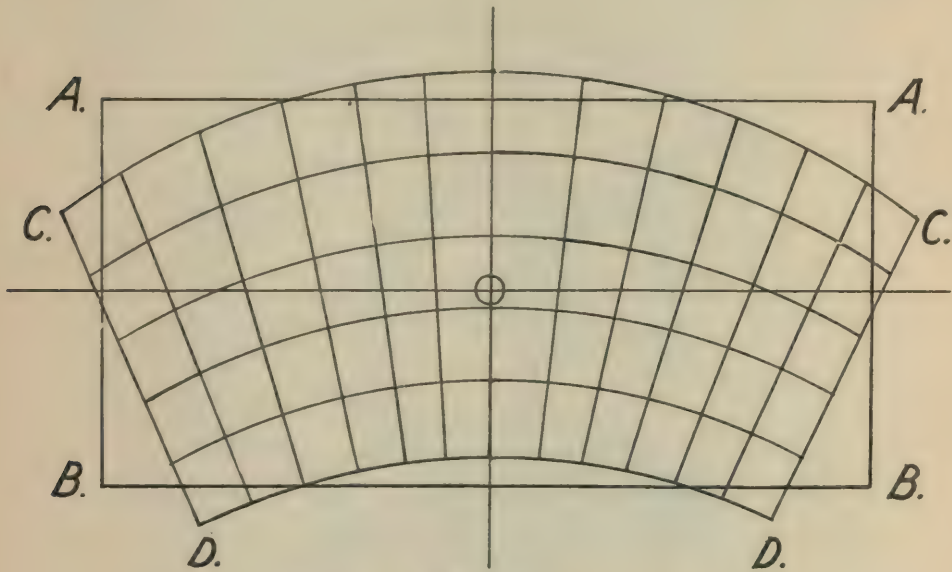


Fig. 1.

6th 3 pounds were added; on the 9th $1\frac{1}{2}$ more and on the 10th $\frac{3}{4}$ more; making in all at this date, $45\frac{1}{4}$ pounds.

Then followed addition of weight day by day with occasional intervals of two or three days; the weight was increased first by $\frac{1}{2}$ pound at a time, and latterly by $\frac{1}{4}$ of a pound at a time until on the 3d of September the wire broke with $57\frac{1}{4}$ pounds. This gradual addition of weight increased the tensile strength a little over 26 per cent.

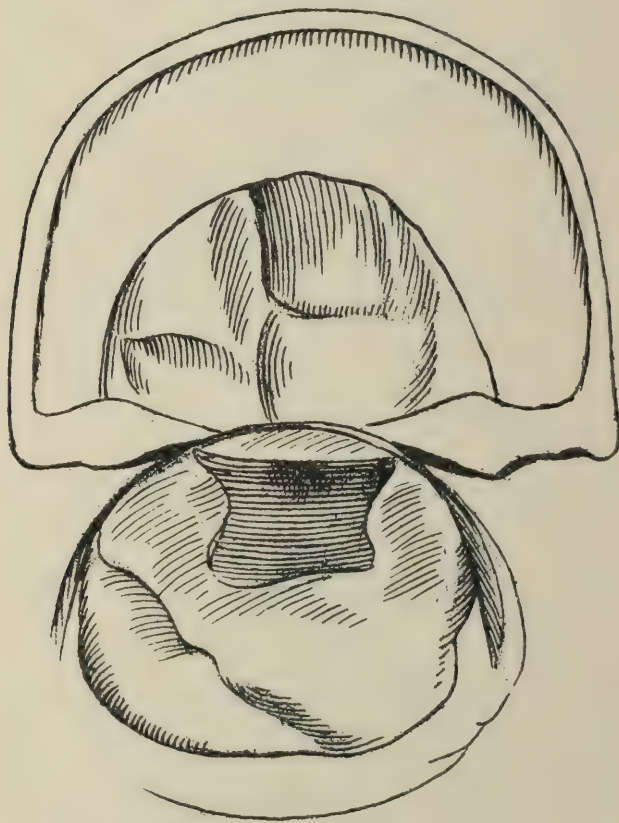
(Both examples are taken from Enc. Brit.)

Civil engineers, in the construction of large buildings, bridges, etc., allow for this mechanical change, which takes place in timbers and metal.

The railroad companies are cognizant of this same principle

and instead of running their engines continually, as would seem they could, with the exception of short stops for cleaning, oiling, etc., on the contrary, notwithstanding an engine represents from \$15,000 to \$30,000, they let it rest, earning nothing, rather consuming, an average of eight hours after it has run 100 miles, so that the relationship of its parts, aye even of its molecules may not become disturbed from long continued pressure and friction.

FIG. 2.



As to shape of spring. In the case of a rectangular substance, Fig. 1., when force is applied at its ends, it bends concavo-convexly. The concave filaments contracting and the convex expanding or lengthening. Hence, in the case of a steel spring, the greater the number of individual strips in a given weight of metal the greater the elasticity.

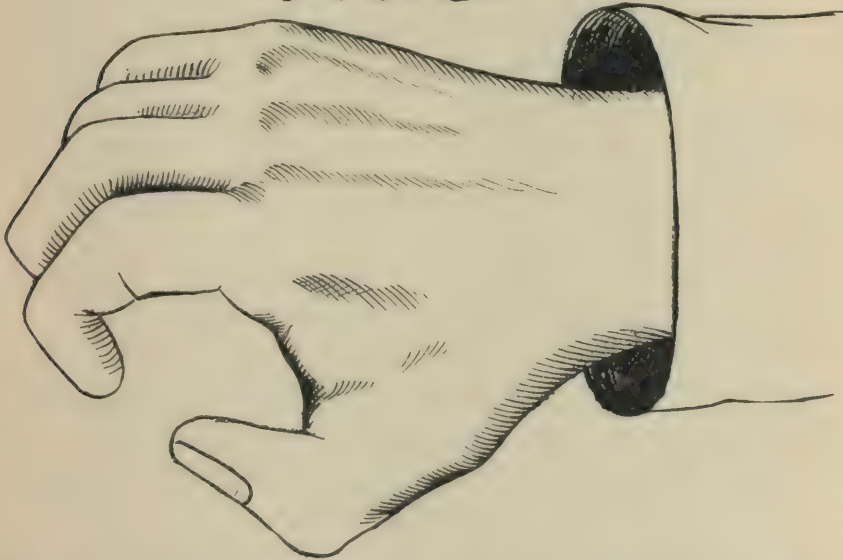
This is why that in the spring of our carriages and hacks there are several pieces of steel; this principle seems to have been

unknown to the ancients, among whom buggy springs were not used.

It might be interesting to state that the ancients did make springs, but not of steel; they made them of "bronze with the addition of from 3 to 4 per cent of tin." (Am. Mech. Dict.)

The application of the spring in dentistry is invaluable and the range of its application innumerable; it is useful in some cases of regulation and separation of teeth; it is indispensable in all kinds of clamps, rubber dam, cervical and matrix ones, where the imperatively required principle is readiness and ease of application, eagerness to grasp and embrace and adjust itself upon the tooth which is being operated upon.

FIG. 3.



This persistent grip of the clamp is analagous to the grip of the human hand which, in this respect, is a clamp that has come from the factory of God. There are times when words fail to picture what we have in mind, and in this extremity we resort to illustrations. Fig. 2.

There is a principle about a steel spring clamp. (and one which a careful research does not show as ever being described), which is analagous to the grip of the human hand. Fig. 3.

It is that simpleness—no screws, bars, nor wedges to be adjusted; it is that ever readiness and willingness to perform a persistent duty. Yielding to extreme pressure, but always ready to return to its position of trust.

Dr. Bonwill has bequeathed to us and to posterity the human arm in the shape of an engine, and the human jaw in the shape of an articulator. Brethren, will you now accept the principle of the human hand in the form of the clamp?

HINTS FOR RAINY DAYS IN THE OFFICE.*

BY H. L. CRUTTENDEN, D. D. S., NORTHFIELD, MINN.

Who does not have rainy days in their dental practice? Days that we might be idle through the failure of patients to keep appointments, inclemency of the weather, dull times or strong competition. Whatever the cause, we do sometimes have them. I pity the man who does not have them. To me they are halcyon days, oases in the desert of monotonous practice.

Something out of the ordinary to me, is a rest. There is no end to what you could do if one keeps his practice up as he should, such as cleaning and polishing instruments, repointing excavators, sharpening burs, posting books, making out bills, reading or writing, and last but by no means least, writing papers for a dental society.

It is not my purpose to write upon any of the above subjects, for they are or should be familiar to you all.

A little "on the side," out of the line of work in the ordinary practice. You may seek to do it for profit, economy, pleasure or art. I do not claim that the methods that I have employed are the best or that they are all new. They are experiments I have made with what I had to do with in an ordinary dental practice, with some additional apparatus at a nominal expense.

RUBBER STAMPS.

The manufacture of the common rubber stamp can be made with the apparatus a dentist uses in every laboratory, with the exception of the use of the ordinary printer's type. This you can have set up for you at any printing office. See that the matter you want has lead about the edges at least $\frac{1}{8}$ of an inch outside the type. It will be tied up with a string. Oil slightly the face of the type, place on a smooth surface and see that all the letters are level; then take a strip of paper about $1\frac{1}{4}$ inches wide and

*Read before the Minnesota State Dental Association, August 20, 1896.

long enough to go about the type and lap; tie this with a string or rubber band, as shown in Fig. 1. This you will fill with plaster of Paris, being careful not to have air bubbles or seams; when set remove the paper and separate carefully the type from the impression; trim the cast off so it will be level and smooth about where the shoulder is, as shown in Fig. 2, or so that the type will be equal depths in all parts, as you see in Fig. 3; have the cast about that thickness also. It is now ready to put into a flask. You can use the ordinary dental flask if it is not too small, or you can make one as

fig 5.



shown in Fig. 5, which will fit into a two flask vulcanizer. Make the iron bands the same size out of $\frac{5}{8}$ iron welded or riveted together to the measurements of $2\frac{1}{2} \times 4\frac{3}{4}$ in.; have pins or guards on the sides to keep them in their

fig 2



proper place. The top and bottom are made of 3 in. band iron, size $3 \times 4\frac{3}{4}$ in.; cut four notches in each piece to place bolts, which are made of common $1\frac{3}{4}$ bolts with one side filed off so it will be flush with the edge of the flask. Insert the cast in the lower part of the flask the same as you would a set of teeth, having it even as shown in Fig. 4, care being taken not to get plaster into the impressions of type.

Next take a piece of gutta-percha or sheet wax, cut it to the size you want the rubber, place over the cast, covering up the impression, wax down the edges so no plaster can flow under it, then shellac and fill the other part of the flask with plaster; when set, remove sheet and pack with rubber, treating it the same as you would for a set of teeth. You can use dental rubber, but you can get the regular stamp rubber, which is much cheaper; clamp the flask tight and vulcanize to 300 degrees, then permit it to cool. When cold remove and clean, trim the rubber and glue to any handle the proper size. Fig. 8 represents a simple wooden form.

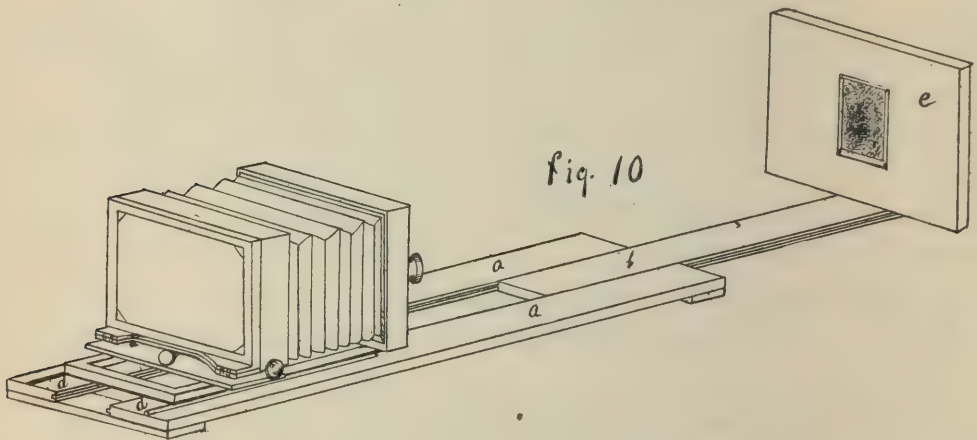
If you have no ink pad, you can easily make them by taking two pieces of wood the same size, place a pad of cotton on each piece and cover with cloth. Put your ink upon the padded surfaces and rub together, thoroughly spreading the ink. Fig. 9 represents this form of pads.

PHOTOGRAPHY.

Copying pictures, making lantern slides, transparencies, etc.

In this line of work it is supposed that you have some knowledge of amateur photography, as this short article will not permit me to go into detail.

In copying pictures, reducing or enlarging them in size and making negatives for lantern slides for contact printing and the production of transparencies, the work is the same and can be described together. In doing this the picture to be copied should be placed directly in front of the camera, the light shining on the picture, care being taken to see it is squarely in front at right angles to the lens. To aid in this I have constructed a stand as shown in Fig. 10. It consists of three matched boards; the two outside ones A.A. are connected with cleat on the under side; the center one B. is movable; at one end is set up a board C. at right

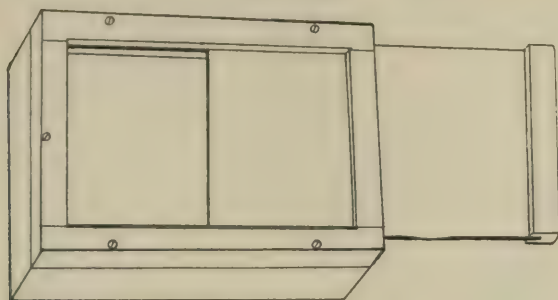


angles; on this is placed the picture to be copied. The camera is placed on the other end of the stand between the two cleats d.d.; the size of the picture is made by moving the board to and from the camera. With this stand there is no danger of vibration when the exposure is made. A great deal depends upon the exposure; it is well to stop it down pretty well and give a longer time; do not overexpose; carry the development so that it will be quite intense; you cannot make a good lantern slide out of a poor negative.

In contact printing the negative must be the size you want the slide or transparency; they are both the same, simply positives on glass instead of negatives, and is only a matter of size and the way they are mounted. The lantern slide is covered with clear glass. The transparency has a better effect if it is in front of a ground glass, which you can frame and hang up in your window. When your negative has been developed, washed and dried, it is now

ready to print from. Place it in a printing frame, the film side up; the work must now be done in a dark room. Take a plate that comes prepared for slides and place it on the negative, so the film will come in contact. Cover the printing frame with a heavy opaque cloth. (A little arrangement that I have made which I like

Fig. 11.



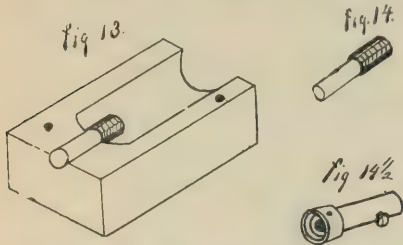
better is shown in Fig. 11. It is a printing frame with a slide attached to the front similar to the slides in an ordinary plate holder. When you are ready for the exposure for the printing take an ordinary lamp and place in the dark room, hold the printing frame up to it about two feet away; draw the slide or remove the cloth. As the time of exposure depends upon the density of the negative, the brightness of the light and the distance it is from the printing frame. This you can only tell by experience. You then develop the plate the same as any other, fix and wash very thoroughly and when dry it is ready to be covered with glass. Before this is done a mat is made of opaque paper as shown in Fig. 12; it should be the size of the slide with the opening cut out to suit the view. This is placed over the film side of the positive and a clean glass the same size is placed over that and the edges bound with gummed paper. Your slide is now ready for use. In making a transparency, the mat is made and placed over the negative before the plate is exposed, then you have clear glass about the edges where the mat was.

In photography there is an unlimited field for novel and beautiful work, and when one gets into it he gladly welcomes a day when he can indulge in the mysteries of the art.

MANUFACTURING AMALGAM.

I will now give you a few hints on a subject that is more in the line of dentistry. In casting amalgam the forms of in-

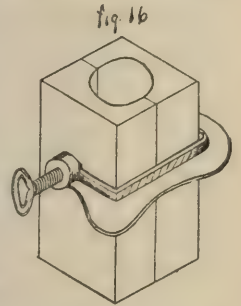
gots I use are made of two pieces of cast iron, the faces are dressed, and with guide pins are clamped together and drilled or turned out one large and one small hole as shown in Fig. 12. In the small one is placed a steel mandrel, Fig. 14, turned down to fit with another part that is not round projecting into the larger, Fig. 13, opening. This mandrel is the proper size



to fit into the No. 5 chuck that comes with the Redman lathe, Fig. 14½, it having a set screw added, as explained further on. With this mandrel placed in the proper place and the part clamped together with a

common quilting frame clamp, your ingot is ready for the molten metal, Fig. 16.

In the "American System of Dentistry," Vol. III., page 813, is given Dr. Keller's analysis of the principal dental amalgams; select the formula you wish, proceed as described in that work, using a crucible furnace. If you have not gas in your office, you can use a gasoline apparatus, which will do just as well. When the metals are fused and poured the ingot is taken apart and is in the form of Fig. 15. This you can put in the chuck of the lathe and set by the screw as described heretofore, file with a coarse file or turn into shavings if you prefer. I have paid for years \$6.00 per ounce for an amalgam, which is rich with gold, the same amalgam I can make for \$1.40 per ounce, or in other words I can melt a crucible full, which holds about 7½ ounces, cast and file up in one day an amount that costs for the metals, \$10.50, for which I would have to pay \$45.00 to the trade, a saving of \$34.50, not bad for one day's work, and a rainy day at that.

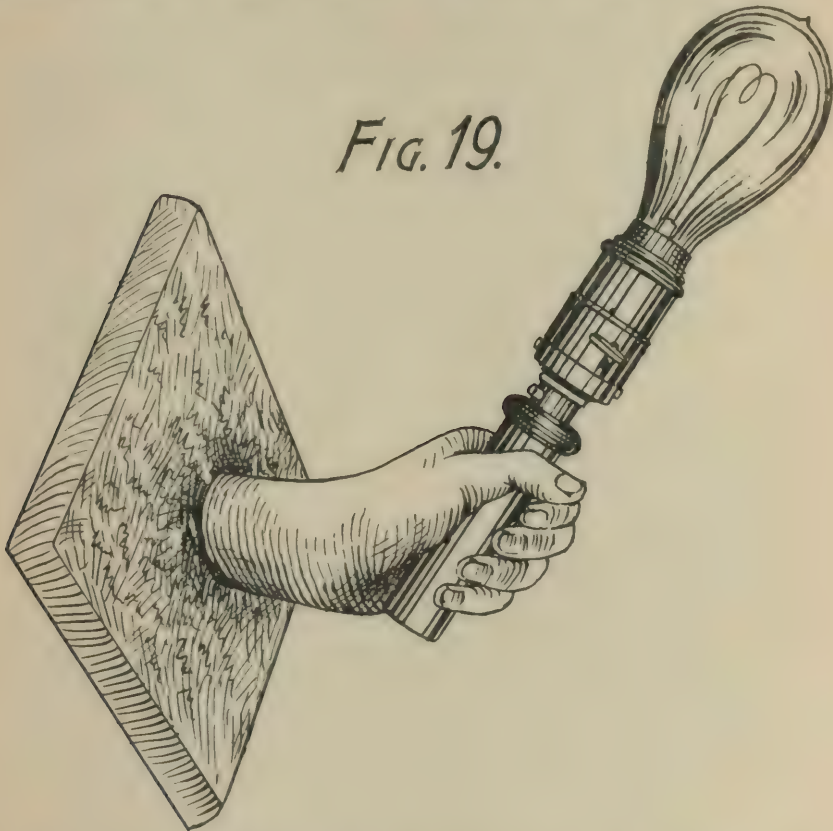


PLASTER CASTS.

In the reproduction of faces, hands or feet in plaster, or the duplicating of statuary, plaques, bas-relief or other works of art, one finds a very interesting line of work and one that naturally fits into the handy work in a dentist's laboratory.

In taking the impression of a hand, oil the parts to be taken, then lay it upon a table or board in the position you desire, then pack about the sides white sand moistened, or moulding sand if

you wish to use it, place the sand up to the largest parts so that there will be no undercuts. Mix up a quantity of plaster sufficient to cover the surface of the hand extending above the sand; when the plaster is set, turn over the cast and hand, being careful not to move the parts while setting or reversing the cast; brush off the sand from the hand and edges of the plaster about it, shellac and oil the edges, then pour the plaster over the remaining portion of the hand. When set separate the parts and



remove the hand, shellac and oil the inside impression, place the casts together again, and bind with rubber bands or string, then fill with thin plaster through the wrist; when set and dry remove the parts and you have the cast of the hand. After the imperfections are trimmed off or filled with soft plaster, the cast can be coated with sandarach varnish, or collodion or gilded as you desire, making paper weights, ornaments, etc., or you can insert two small bolts in the end of the wrist and fasten to a plaque or slab to be placed upon the wall, holding vases, candlestick, glass globes or electric light burners, and one can take a cast of a child's hand, which might be of untold value in after years to its

parents, or to one's self when grown. I have one taken of my boy at the age of four years and another at twelve, taken a few days ago, one forming a candlestick and the other holding an electric light globe. Fig. 19.

In taking an impression of the face, place the person in an inclining position, oil the surface, place thin paper over the closed eyes and goose quills in the nostrils to breathe through, and if there is a mustache or beard they should be covered and matted down with soap lather; the plaster is poured over the face; when it is set remove and treat the same as described before.

In duplicating a cast piece of statuary bas-relief, plaque, etc., if simple, they need no directions, but should there be undercuts, etc., it must be taken in sections. Take an impression of one surface, remove and trim off the edges and make some indentures or grooves, shellac and oil, then place back on the original surface and plaster on another surface and remove and proceed as before until all the parts are covered, then shellac the impression as described before and then place all the parts together and fill with plaster; when hard remove in the reverse order in which they were put on. If care is taken a number of duplicates can be taken of the same model. Care should be taken not to have undercuts by which you might disfigure or damage the original. I have a pair of cherubs' heads, Figs. 20 and 21, which I have sectional parts of showing the methods by which I have taken a large number of casts. These and other articles that are intended to hang upon the wall I take a piece of copper wire, bending up the two ends before the material, Fig. 18, is set, place the ends into the plaster so that the center position of the wire is even with the surface, then trim out in under the wire enough plaster to form a cavity, then it can be hung upon a tack or nailhead, or a ribbon attached to the wire. A plaster duplicate of a card receiver representing the "Landing of Columbus," Fig. 22, was taken a few days ago and represents an easy and simple form, there being no undercuts. This might look better with just the sandarach or collodion coating, rather than waste so much paint, but it shows how an article can be treated if time and inclination permits. Now, if with these few hints, given to you in my feeble way, I have enabled you to get a single idea whereby you can use them to your profit, or better still produce some article of interest or beauty to adorn your office, your home or those of your friends, I shall feel that my hints for rainy days have not been given in vain.

NOTE.—Several cuts omitted.

A CONSERVATIVE ESTIMATE OF THE VALUE OF CATAPHORESIS IN DENTISTRY.*

BY C. W. JONES, D. D. S., ST. PAUL, MINN.

It frequently happens in the practice of our profession that operations for the preservation of the dental organs are so simple that our calling would seem to be on the same plane as that of a mechanic or artisan of the lowest order. What is simpler than to excavate a small crown cavity and hammer in a few pellets of gold; or even large approximal cavities only require a little more skill in properly shaping the cavity, and replacing the part of tooth structure by hammering in one piece of gold upon another until the original contour of the tooth is obtained. The same amount of skill is required of a carpenter who chisels out a cavity in a piece of wood and fits in another piece accurately for the purpose of a joint, or which is done to remedy some imperfection. But when we are confronted with intelligent beings and sensitive nerves, then our operations have an entirely different aspect; and to perform such under the various conditions and influences which are presented to us without irritating or distressing the nerves of these organs requires such skill and scientific knowledge as to baffle the greatest intellects in both the medical and dental professions, who sometimes spend a lifetime in investigation on discovery, and to a certain extent in making novel experiments.

Scientific dentistry is, however, on the advance; and many obstacles which to our forefathers seemed insurmountable, are being cut through, and the physical sciences in their advance are constantly contributing their assistance in the march of medical and dental science.

Superstition, charlatism and quackery, with their multitude of "secret formulæ" and "patent painless processes," if now and then they struggle to the front, are nowadays more readily exposed and more quickly denounced.

If all persons who present themselves to us for repairing their dental organs were possessed with an otherwise perfect physical organization (mental as well) we might insist on their cultivating that "Spartan spirit" as of old, that they might endure the slight pains and inconveniences while undergoing our operations without flinching. Then most of our tasks would be as simple as those

*Read before the Minnesota State Dental Association, 1896.

of the carpenter or plumber, or a more "up to date" comparison would be that the plugging of a tooth would be as simple and as little distressing as the operation of repairing with a plug a delicate puncture of a pneumatic bicycle tire. Such cases, however, are few who present themselves to us for treatment; on the contrary, the majority come to us who under various conditions and influences have their sensibilities exalted to such a pitch that they come with "fear and trembling;" and it behooves us to use all the skill and knowledge in our possession that will render our operations as painless as possible.

Is it not a matter of our daily observation and experience that we see women of the wealthier classes, high born and delicately nurtured, as well as their less fortune-favored sisters, overworked and sensitive, laboring in any one of the many occupations into which the struggle for existence in modern times has forced them, and competing with men in physical and mental callings, who have in their constitutions all the ingredients that render them prone to shrink from physical suffering, even from slight and transient causes? Then we have the young lady who by premature introduction into society has been forced into habits such as late hours, feverish excitement and little exercise have weakened her nervous system and rendered her susceptible to suffering from the slightest operation. The advent of the bicycle, however, promises marked improvement for the better for these classes of people.

Men possibly fare better than women in this respect, but we have those of the nervous temperament whom nature has endowed with an exuberant nerve force—men of impulse and energy, their nerves like their minds are prone to morbid exaltations and respond readily to irritations, such as those attending operations on the teeth.

Too many of us who are in full practice, and are anxious to complete a certain operation in a certain time, so as to be ready for the next victim, or possibly to attend to other duties awaiting us, are too prone to disregard this class of patients thinking that their suffering is only slight; at least it is often inconvenient for us to admit that it is more than that. So long as we have made a perfect operation, we think we have done our duty, and from professional pride we refuse to admit anything to the contrary. The consequence is that these patients the second time, will fall into the hands of some charlatan, who by happy chance finds the next operation

a simple one, or may prefer to treat temporarily so as to avoid giving pain, then boasts, by confounding truth with falsehood, of his secret methods for preventing pain.

Our mission is not, however, to guard against the encroachments of charlatans, but we should be careful of our patient's best interest, our own reputation, and the honor of our profession, using all the knowledge and experience of others at our command for the relief of suffering humanity; this accomplished, we have done our duty and in so doing elevate the plane of our profession.

Since the first of the year our dental periodicals and journals have been flooded with articles on the method of obviating pain incidental to excavating sensitive cavities in the teeth, by the process of cataphoresis. Previous to this it has been hypnotism, hypnotic suggestion, dehydration and many other methods too numerous to mention, all of which are useful in their proper places, but not to the extent we would desire them to be.

From accounts published in the January and February numbers of the *Dental Cosmos*, I was led to believe that sensitive teeth could be completely anæsthetized by cocaine cataphoresis, and at once resolved to give the process a trial, and will therefore give the result of my observation and experience of this process in various cases. Being somewhat skeptical as to the practical advantage of this process, for the reason that it did not appeal to me from reports given, that the process was a success in cases of extreme sensibility in nervous patients, and not wishing to spend \$50 or a \$100 for an apparatus with which I had no personal clinical experience, I secured for trial a fifty-cell battery, with Wilm's current controller. Here is the result:

Case 1. Patient, a lady aged about forty-five, of nervous temperament, and exceedingly sensitive teeth, but bears pain with fortitude. In attempting to excavate a labial cavity in a left inferior incisor my patient could not allow the operation to proceed; I then applied guai-cocaine cataphoresis for fifteen minutes. With the exception of a few twinges of pain from the electric current due to a faulty manipulation of the instrument, the balance of the operation was completed without the slightest pain.

Case 2. Patient young lady aged fifteen. Teeth soft and not hypersensitive. With Wilm's current controller, thirty to forty volts was reached in two applications of fifteen to twenty minutes each, anæsthesia was profound enough to drill deep retaining

grooves without pain. Time consumed in preparing these two approximal cavities in superior bicuspid, was one and one-half hours. The anæsthesia in these two cases was evidently much more complete than was possible by other methods known to me, so I at once ordered a Wheeler Fractional Volt Selector, and the following cases I report from the use of that instrument. It may be noted here that the last mentioned patient was perfectly willing to bear the pain of excavating, and did not call for an anæsthetic as I had at previous sittings excavated and filled six or eight cavities, the most sensitive of which were in the wisdom teeth, posterior and labial cavities, too inaccessible to manipulate cataphoresis. I therefore consider cataphoresis of little value in such cases, because I could not use it where it was most needed, and other methods would bring about the same result in less time.

Case 3. Young lady aged fifteen, two sup. approx. cavities in right bicuspid, not sensitive to breaking down enamel walls, but very sensitive on reaching dentine. Cataphoresis in both cavities at once. Seven volts reached in ten minutes; forty volts reached in eighteen minutes. After twenty minutes time both cavities were nearly prepared, but a second application of forty volts, reached in five minutes. Balance of excavating was painless. The following day I prepared and filled two approx. cavities on left side of the mouth for the same patient who remembered that the pain was greater on the previous day from the electric current.

I had however not observed any distressing symptoms excepting when the current approached the six and seven volt mark. Cataphoresis then would seem to be of little value in her case.

Case 4. Patient young man, aged twenty-eight. Two sup. right bicuspid approx. cavities. Teeth hypersensitive. In attempting to excavate, patient would flinch, snap his fingers, and protest against my going on with the operation. Guia-cocaine cataphoresis was then applied simultaneously in both cavities; forty volts was reached in eleven minutes without pain. Current continued four minutes. Result—posterior cavity thoroughly anæsthetized, interior slightly sensitive to the last cutting. Patient remarked that it was the least pain he had ever experienced in having teeth filled.

Case 5. Little girl, aged thirteen. Simple crown cavity in inferior molar. Patient both apprehensive of, and sensitive to pain.

I had previously filled several cavities for this patient, but it required a great deal of patience and coaxing on my part, which made the operation very irksome to me. In attempting cataphoresis, I could not reach above one and two-third volts in twelve minutes time. Cavity was still sensitive. A little leathery dentine was removed, and in a second application two volts only could be reached in twelve minutes. Cavity still sensitive. Patient remarked that she would rather be hurt with the bur than to have "that thing" on her tooth. Here is where the current should be increased continually instead of by fractions of a volt, which is impossible with a Wheeler instrument.

Case 6. Young lady, aged sixteen, of an excitable temperament; hypersensitive teeth. Small posterior cavity, superior right molar; one and one-half hours' time was consumed, in applying guaiacocaine cataphoresis. Could not prepare cavity for gold, and was obliged to fill with cement. Result, a complete failure.

Case 7. Patient middle aged lady, of nervous temperament, and hypersensitive teeth. Small posterior cavity left superior molar. A current of about twenty-three volts was reached in twenty minutes, with but little inconvenience to the patient. I was just about to replenish the cotton pledget in the cavity with more guaiacocaine, when my patient became frightened and even grew hysterical, pleading for me not to administer any more, as she was just about losing consciousness. The current was discontinued, and these symptoms disappeared in a moment. In excavating the cavity, the dentine was found to be only slightly anæsthetized. This is the only instance in my knowledge, or that has been brought to my notice through reports, where there has been any toxic effects or systemic conditions of this nature that have been brought about by cataphoresis for sensitive dentine.

Upon inquiry my patient informed me that on previous occasions in having her teeth excavated, she had been in the habit of taking chloroform or nitrous oxide, or "something" to the point of almost losing consciousness, and that she behaved in the same manner on those occasions.

The only possible explanation I can give for this effect, is that it was of a psychic nature and was brought about entirely through the medium of the imagination. I might go and enumerate a number of other cases, some of which were successful and some unsuccessful in the same mouth, but time will not permit, as those

I have cited are fair examples of cases that present themselves to us in general practice.

It will be observed from the foregoing, that cocaine cataphoresis for sensitive dentine, though producing true and profound anæsthesia in certain favorable cases, is quite limited in its application.

Unless we have an anæsthetic that can be applied in cavities like those of posterior and labial cavities in wisdom teeth, and others where it is impracticable to use the rubber dam in the first place—cavities often the most sensitive in the mouth; unless we have one more effective than this method seems to be in obstinate cases of patients sensitive to the electric current; unless we can have one that the pain so often complained of in the first stages of this process in irritable teeth can be dispensed with, and without the consummation of so much time; we have yet to continue our researches and experimentation.

While I admit that this process promises a more universal usefulness than anything we have before had at our command, it is not of much assistance in a large percentage of cases where an anæsthetic is mostly needed. Dentists in the east seem to have had better success than the report I have given, but we all know that the climate of Minnesota is conducive to nervousness, consequently our patients are more sensitive to the electric current, which in a degree would lessen the usefulness of this method.

I will say that for the extirpation of pulps when nearly or slightly exposed, this method is a complete success, and the apparatus necessary is worth having for these cases alone.

As yet I am unable to make a statement as to its value where the pulp is congested, but would suggest that a new exposure below the congested part be made, and introduce the current at that point.

It is needless for me to here describe in detail the apparatus and appliances so recently sprung into existence for the control of the electric current or the technique of operating, for they will be better demonstrated at the clinic to-morrow. There will be plenty of them there. Dr. Hartzell is to demonstrate the application of cataphoric medication to the teeth and soft tissues.

In order to use this electric force intelligently it behooves us to study the varieties of currents which may be produced and the laws which govern them. I take for granted that you have all read

the literature on this subject which has appeared in our periodicals. In addition to this I would recommend for your perusal a work entitled "Electricity in Electro-Therapeutics" by Houston and Kennelly. It is one of the "Electro-Technical Series," published by the W. J. Johnston Company, 253 Broadway, New York.

For those of you who intend using cataphoresis for the first time, I would recommend that you reserve for your patient at least two hours' time, and bar all intruders for the time being from your office. You cannot afford to be annoyed by having an office full of people waiting for you. If your attention is attracted to other duties, you are very apt to force the current or break the circuit, thus causing pain when you are trying to avoid it; and instead of "revolutionizing the practice of dentistry" you will be setting your patients in a state of revolution against you.

In addition to the many useful applications, of the electric force, which have been suggested by different members of the profession, I will add one or two which are among the possibilities.

The first is that we may produce by electrolysis, dentine or enamel or some kind of vitreous coating to shallow cavities at the gingival margins due to recession of the gums. Dr. Morton, of New York, has shown that solid particles can be carried with the moving fluids.

Why not use the process of electro-gilding by pressing particles of gold or other metallic substances or some lime salt deep into the dental tubes so as to form permanent part of the tooth.

Another is that the magnetic force which is powerful, painless and harmless to the physical organization, may be utilized in driving cocaine into the dentine. It had been demonstrated by wrapping an iron cannon with magnetizing coil, and producing sufficient magnetism to cause heavy iron bars or bolts to be sustained on the person of a soldier, standing before the gun without producing any changes in circulation or respiration or any sensations whatever, other than those of pressure from the attracted masses of iron.

We find that cocaine and the electric current when it can be used in sufficient quantity are very effective. But the trouble is that getting the sufficient quantity of current causes pain. It

may be that human ingenuity will yet discover a means of magnetizing our anæsthetics so that they may be driven through dentine by this force in itself so powerful yet painless. I only offer these suggestions as among the possibilities.

PULPITIS.*

BY L. L. DAVIS, D. D. S., CHICAGO, ILL.

Inflammation of the dental pulp is so common in practice and has been the subject of so many essays that it is impossible for me to present any new ideas upon it at this time, therefore, I am restricted to a recapitulation of the theories of others.

The stages of inflammation in this tissue are the same as in other parts of the body, viz., redness, heat, pain and swelling, and differs only in the termination; resolution seldom occurring. Hyperæmia invariably precedes the inflammation, and as the increased blood supply reaches the period of stasis we have, by reason of the pressure on the walls of the vessels a serous exudate into the subjacent tissues, resulting in œdema. The redness and heat is readily accounted for by the greater quantity of blood in the part. Pain is partly due to the irritation which produced the inflammation, and partly to the pressure on or tension of the nerve tissue by the swelling.

Of the tissue changes that occur in the progress of inflammation to a termination, this paper has little to do; the theories of authorities are widely divergent, that is regarding to stages of return to embryonal tissue—mother tissue—fundamental tissue, or whatever the writer may see best to term that state which all agree must take place before any process of reparation occurs.

As before stated the termination of an inflammation of pulp tissue differs radically from other tissues of the body, by reason of environment, the hard wall of tooth substance and the minute foramen at the apex of root combining to produce the one result, suppuration and devitalization.

The dental pulp has also a sensory function different from that of all the other tissues, viz., the sense of pain from thermal changes. In diagnosis this function is of special importance when we consider that the sense of touch is wholly in the peri-

*Read before the Chicago Dental Society.

dental membrane, and that to be accurate in our symptomatology the peridental membrane and pulp must be considered as making the sum total of a tooth's sensory functions. No one can locate with certainty a diseased pulp by the sensation of pain alone, and the patient is very likely to refer the location by some chance notion to another tooth, or even jaw. Pain is not always referred to teeth in these cases. Neuralgias, pains in the angle of the lower jaw or earache may be treated for, and not until the dentist is called in is relief met with.

The teeth are not sore to touch in hyperæmia or acute pulpitis, the tap of the instrument does not bring out any evidence of the offending member; but a stream of cold water or the application of a small piece of ice will speedily indicate where the trouble lies. Pain in hyperæmia is sharp and lancinating in character, and as most inflammations are accompanied with hyperæmia, therefore the same symptoms are present, the only difference being in duration. In hyperæmia the pain is paroxysmal; in pulpitis it is more continuous; the pain instead of ceasing keeps up a dull ache, usually increasing when the body is in a recumbent position, this being due to the increased flow of blood to the part.

The causes of inflammation are exposure of pulp by decay, the presence of food fragments with fermentation, abrasion, accidental injury, the waste products of microorganisms and sometimes by the operations of the dentist in preparing cavities or inserting fillings. It is therefore very necessary to take proper precautions against exposing a pulp during the removal of caries, and to thoroughly protect from thermal changes where the filling is in close proximity to pulp. Regarding the proper method of procedure in the relief and cure of pulpitis there are many ideas and theories. Occasionally, it is possible to give relief, and by careful treatment to keep the pulp alive for some time; but the final result is the same in all cases—devitalization. Whether it is best to attempt to save the pulp for a time depends upon the location of the tooth and the age, sex and physical condition of the patient. To properly treat pulpitis the decaying matter and irritating causes must first be removed, depletion of the blood vessels by bleeding and warm water to remove debris, to be followed by the use of some antiseptic and germicide that will at the same time obtund pain. Then a capping of some material sufficiently plastic to be introduced without causing pressure, rigid enough to stand

the pressure and force of mastication, and possessed of nonconductibility to preserve the injured member from thermal extremes. Then, if all these operations have been carefully and thoroughly performed the pulp will quietly die without disturbing its owner.

The delicate operations of ten or fifteen years ago, namely, the excision of a portion of the pulp and drawing the wounded edges together, or the amputation of one pulp root and the capping of the other, is not practiced much in these days, at least we do not hear so much about them.

In the use of arsenious acid—which is the remedy of all remedies for pulpitis—care should be observed in reducing the inflammation before its application by relieving the parts from irritation and keeping the pulp in a partially anæsthetized condition for a few days. Since the introduction of the electrical appliances for cataphoresis I have attempted the removal of tooth pulps by its use, and met with good results.

It is not my province to go into the methods of procedure after devitalization, nor do I feel warranted in going into details of pulp capping, etc. I therefore leave the subject for your discussion.

SYSTEMIC TREATMENTS.*

BY E. L. CLIFFORD, D. D. S., CHICAGO, ILL.

On April 21, 1896, the Supreme Court of the State of North Carolina handed down for the government of its constituency a decision as to what constituted a dentist; in other words, a *legal* definition of the term. So far as I have been able to learn, the question up to this time has not been presented to or decided by the great tribunals of other jurisdictions. The effort has more than once been made to incorporate within the dental laws of certain States such exact terms upon this point as would leave no room for doubt. Opposition, however, has so constantly been met, not from the public but from the rank and file of the profession, that to this time effort has been futile. The decision referred to having been placed upon the statutes of even one jurisdiction seems to indicate that the time has arrived for the dental surgeon of the future to know where he stands. Within the greater jurisdiction of the United States we have our National Associations of

*Read before the Northern Illinois Dental Society.

Faculties and Examiners. To them has been conceded to prescribe the limits of time and proficiency within which the recognized colleges shall admit to practice the students committed to their care. These limits have been broadened year by year until the curriculum of the dental student now embraces all of the fundamentals of general medicine, not to a prescribed extent, but in their entirety. No professor of anatomy passes in final examination the student who has confined his studies to the head and face. Would the professor of physiology think the student of '96 proficient who had not to a reasonable degree—a degree the same as is demanded of the students of medicine—mastered the function of the digestive, circulatory, nervous, osseous, muscular and other systems? The same position could with equal accuracy be maintained in the branches of chemistry, materia medica, therapeutics, etiology, pathology, symptomatology, bacteriology, hygiene, etc., etc. With these duties imposed upon the aspirant for dental honors and for professional protection, can the associations to which we have referred countenance and allow to stand a decision that says "that the duties of a dentist are limited to 'manual and mechanical' operations on the teeth;" that "a dentist or dental surgeon is one who performs manual or mechanical operations to preserve teeth, to cleanse, extract, insert or repair them." If this definition is to be the accepted one, and the law of the land and age to which we have advanced, your time and mine spent in the study and discussions of such subjects as I have been requested to present at this meeting is but wasted. No matter how competent we had individually become to aid, assist and relieve suffering humanity within our sphere, no matter to what extent the general practitioner had neglected the field of dental pathology, we would be powerless to use our special study, and special knowledge consequently would be useless. To say that, as the definition is a relic of the days of ignorance of the past, so the dental patients of to-day must be deprived of many advantages and helps which our growth and advancement of the past few years have placed within their reach; and as a profession we must stand still, with hands and brains bound, destined to retrogression, for you know "nothing stands still." Advance or go back.

'Tis not the time or place to further pursue this thought. Will our national associations take the cue? With present re-

quirements of proficiency, claiming the choicest and best four years of any young man's life, is it not justice to them that in positions and questions which bring them to the courts of any State in which they may use the knowledge taught them, they will only be required to show (natural honesty of course being understood), with all other branches of medicine—"ordinary skill, ordinary care and ordinary precaution."

Let us know where we are at. If it is absolutely necessary, in order to be safe and in order to give our clientele the advantage of the best possible skill, the quickest, surest and safest relief in time of trouble, that the M. D. be added to our names the sooner the fact is made known the better. For the present, I shall not accept the dictum for Illinois, but will proceed with the assumption that dentists, educated within the recognized schools of dental surgery, are fully authorized under the laws of the State chartering the institution, to practice in all of its departments, and have equal rights to administer remedies and perform surgical operations with the general surgeon.

I know that many of the older practitioners have succeeded well, accomplished much, and will probably tell us that they rarely give a dose of medicine. If so, may we not ask, have we covered the entire field? Have we reached the acme of our hopes and desires? Are there no "other worlds to conquer?" In this rapidly advancing age of physical discovery in which scientific methods of exact application have produced results far ahead of anything that was ever attained in all preceding time, we must surely have learned something; something that can be relied upon and demonstrated as fundamental truth. If our sphere of usefulness can be broadened, if we can accomplish more in the future than we have in the past, let us push to the front, taking advantage of every iota of truth found within the great realm of eclecticism, ever broadening and widening with its vast store of natural and scientific products as free to our grasp as the sunlight and air.

I would not undervalue topical treatments, nor the great benefit we have been able to be to our fellow man with this aid alone. I would not claim that in dental practice we could, in a great many cases, arrive at results by systemic medication that it would be impossible to attain by topical applications alone, but I do believe that we can broaden our sphere of usefulness (still

keeping within our just domain), that in the general and proper exhibition of internal remedies we can save *time* and *pain*; two most valuable considerations, both to patient and practitioner, and two which yield the full fruits of appreciation.

All deviation from normal is disease—differing as to results only in degree. Diseases result from causes. Remove the cause (if possible) and nature, as a rule, will do the rest. Some causes, however, we hold to be more remote than the organ to which our attention is immediately directed, and even nature in many cases has been crippled or weakened by overtaxation.

We also hold that internal medication is useful only to the extent of assisting nature by antidoting or antagonizing some poison, or by stimulating her to a proper performance of function. Full importance is placed upon the *vis medicatrix naturæ*. No one believes more fully than your essayist that in unincumbered and unpoisoned nature there is no such thing as disease. Unfortunately, however, the decalogue stares us in the face. Children are born daily, powerless to cope with the burdens of life. Civilization certainly has its misfortunes as well as its pleasures, and the experience of every practitioner of five years tells him that only too often is he called upon to build a proper foundation upon which to erect a structure. If nature makes no mistakes, can we say the same of nature's creatures? Let us remember that there may be, and often are, secondary as well as primary causes, and also, that even in the practice of the experienced, one may be taken for the other.

Fortunately, in the practice of dentistry many of our causes are located in the mouth, and it is but an easy matter to remove the cause and allow nature to cure the disease. The differences of opinion, as shown by many recent and able writers would, however, tend to show that some causes either have not been positively located, or else, their removal seems to be a matter of impossibility to the practitioner of average, sometimes expert skill. We are fortunate that this state of affairs is vastly the exception rather than the rule in our field.

A paper with a caption like this one must of necessity treat of, and confine itself to the diseases, as we generally term them, which come within the province of the dental surgeon. In the treatment of all diseases three principal objects should constantly be kept before us. First. To remove the cause if possible. Sec-

ond. If not possible to remove it, to obviate or ameliorate its effects by placing the patient in improved physiological condition, making him better able to resist the onward course of the disease. Third. To make the patient as comfortable as possible while we are exercising our skill and ingenuity to hasten recovery. This can but be termed rational medicine, it can but be termed scientific therapeutics, because based upon exact knowledge of the effects of all remedial agents. If this is accompanied with a full understanding of the pathology of a given case, it seems the therapist is as near master of the situation as it is possible to be with our present attainments. We believe, with a late writer, natural therapeutics to be more potent than applied. We cannot, however, ignore the fact that too often it is impossible to take advantage of their beneficent power. This is an ambitious world. How often have we advised rest, change of environment, proper diet, etc., only to be met with the answer that time is too precious.

As dental practitioners, too, we are brought to face a difficulty that our medical confrères often escape—our patients are usually on their feet and able to be about, their's are usually in bed and can be controlled. In the absence of our natural therapeutics are we powerless, must we feel that our limit is reached? Must the young lady, or young man from twelve to twenty years of age, passing from childhood into womanhood or manhood (especially the former), the time when the life forces are taxed to their utmost, the mental faculties being severely strained from study, when physical culture is being neglected and too often the nervous system suddenly exhausted and where the interruption of assimilation and nutrition has weakened the entire organism by lack of nourishment, have no helping hand extended to them? None of us, I believe, but that could furnish from our book of experiences just such cases of patients passing through the stage of adolescence presenting evidences of imperfect calcification which we have been taught to attribute to faulty assimilation and nutrition. In such cases, of course, an intelligent application of natural therapeutics, if unincumbered by hereditary taints and weaknesses, would in a great measure accomplish the desired end. Their application, however, we would place in the list of general systemic treatment.

The term systemic remedies, or systemic treatment, as now understood, is used in a somewhat different sense in the specialty

of dentistry, than when applied to general medicine. In general medicine the term would be susceptible of further division than appears the custom in dentistry. Owing to the fact that in dentistry the past treatments have been so universally topical, any treatment not topical or which passes through the various routes to the circulation are usually termed as systemic. In general medicine an internal remedy would not necessarily be a systemic remedy, for a systemic remedy would be defined as one not intended to affect the organs by which it enters the body nor those by which it is finally excreted. But would be given with a view of bringing about some change in the general solids or fluids of the body so as to affect nutrition, and, as a rule, do this through some effect upon the nervous system. Remedies designed to affect special organs would be termed local or organic remedies. I would not be understood as saying that this distinction did not technically hold good in ours, or any branch or specialty, but usage has had its effect upon our nomenclature here as elsewhere. To the dental specialist judging from our literature, the term internal seems preferable to systemic treatment.

In the time allotted me, were it possible, I trust I shall not be expected to lay down dogmatic rules, nor to furnish specific treatments to routinists. By a specific remedy we would understand one having the power to stop the course of a particular disease and act as an antidote to its effects. In my efforts to treat diseases, and in my experience with applied therapeutics I have discovered no "sure cures," no true specifics. Notwithstanding certain pathological manifestations are so uniformly controlled by certain remedies, in all branches of medicine, as place upon these remedies the character of specifics, all of them sometimes fail and often must be combined with other remedies in order to produce the best results. The differences in persons, in localities, in surroundings and in accompanying and complicating circumstances precludes the hope of formulating certain rules from which we may expect certain results. We do not accept the dictum that "there is a mysterious relation existing between certain diseases and particular remedies" or that no cure could possibly be effected without a certain drug, no other in the given cases being serviceable. We have too much appreciation for the law of cause and effect—again—too much confidence in the *vis medicatrix naturæ*.

We do believe, however, that the functions of nature are some-

times obstructed, the results of the obstructions being sometimes manifested in the oral cavity. To reduce and remove these manifestations, proper attention to the reëstablishment of function we believe to be indicated and a remedy is said to be indicated when the symptoms show that the function of some part of the body is disordered and our knowledge of the physiological action and chemical effects of a remedy indicates to us the probability that its administration would produce favorable results, or be an assistance at least toward that end. So it is difficult to particularize. We can at best but generalize with the statement that the practitioner who aspires to step from the old and beaten track of entire dependence upon local treatments, is broadening his field and must properly prepare himself to recognize the minor through important differences in apparently similar cases.

I have stated that the first duty in the treatment of a diseased condition is to remove the cause if possible, and I have intimated that many of the causes which confront the dental specialist are found within the mouth and consequently within the reach of topical treatment and instrumentation. The inference is left that some causes are remote and not so easy of access. Do our investigations into the causes of dental caries teach us that the teeth of all persons are alike susceptible to the action of contaminating influences? If not, why not? We think we find a partial answer at least by looking a little to the general health of the patient, environment, habits, etc. Would not a deficiency in the normal constituents of the blood, the nutrient fluid of the body, tend to promote just such a result of defective structure as is present? Can the chemistry of the blood be changed? If it is again supplied with its proper elements, would the tendency to the maintenance of proper structure and the performance of function be increased? The answer can but be in the affirmative. It is desirable always to modify deranged processes. Whenever the quality of the blood is improved, the nutrition of the entire organism is improved. Destruction of its corpuscular elements and drain of its albumen show that the nutrient fluid tissue urgently requires increased and appropriate pabulum. In health this supply is derived from the food; but in pathological conditions must be administered in more concentrated and less complex form. In our effort to assist nature, however, by the exhibition of proper remedies, we would not fail to place due importance upon a suitable dietary in

all cases which seem to demand their use, as also upon the necessity for exercise, fresh air and sunlight. No treatment will accomplish much without due attention to these hygienic regulations—so much for the condition of defective structure. Within our specialty, many of the lesions brought to our notice are of an inflammatory character. We would remember that inflammation, *per se*, is no disease, but an effort on the part of the organism and the tissues affected to eliminate, or render harmless the primary causes. Do our therapeutical studies show to us that certain agents and preparations within our pharmacopœias possess the power of assisting nature in this work. Do our colleges require us to pursue the studies to that depth as should make us competent to take advantage of their power by their judicious use? The question, I think, I have already answered. As a profession, we have been criticised for doctoring symptoms. It could hardly be otherwise. The treatment in each individual case of inflammation must be symptomatic. A proficiency, however, that will enable us to properly locate the cause of these symptoms will greatly enhance our chances for success. It is true that the best way to treat inflammation is to prevent it; prophylactic treatment is certainly the most important and satisfactory. Secure for the place deprived of its effective protection against the entrance of pathogenic bacteria an aseptic condition by antiseptic measures and bring in contact with it only things that have been thoroughly sterilized. But, in many of the cases that come to us an inflammatory condition already exists, and then it is that our efforts to obviate or ameliorate its effects must be exercised.

If there is any history of specific disease the patient should be referred to his physician for a thorough antisiphilitic course, which will always produce a marked effect for the better on the inflammatory process. The same should be said of catarrhal, rheumatic and tubercular subjects. Do not understand me to claim that it is the duty or prerogative of the dentist to take in hand and presume to treat rheumatism, tuberculosis, catarrh, or any of the constitutional diseases that have been referred to. What I claim is that with the advantages furnished by our dental schools of to-day, and taking into consideration the present requirements for graduation in most of the States at this time, the dentist should be cognizant of the fact that many general pathological lesions manifest themselves within our domain; that in

their presence it is certainly more difficult for us to procure for our patients the ease they desire; that he should be able to recognize such etiological factors; that he should know the effect such factors have on the general functions of the body and that he should be competent, as it is his privilege to prescribe such treatment as will obviate or ameliorate at least the influence of said factors on the organ brought to his notice. People suffering from such effects do not as a rule apply to the physician; they apply to the dentist, because they believe they have something the matter with their teeth or oral tissues. And it is the privilege and duty of the dentist to give temporary relief at least, always advising consultation with their family physician, that their functions may be so corrected as to remove the probability of a return of the trouble. I think I would be safe in saying that I think the dentist of to-day would be criminally liable for allowing his patients to suffer protracted pain, with the agents now at our command, whether the cause of that pain be local or remote, provided the case is brought to his notice sufficiently early. I also could hardly excuse him for an inability to relieve the extreme nerve tension or blood pressure so apparent in some patients when we first see them. Whether his effort should be directed by psycho- or applied therapeutics is a matter for each one to decide for himself. I would not undervalue personal magnetism or even psychological influences. A good, clean, conscientious, industrious, honest man or woman can but exert an influence for good. "Mental phenomena and physical processes I believe to be harmoniously and sympathetically adapted." How (according to a recent and valued writer) we do not know; never can know. Suffice to say "When the system of adjustments between the relations of phenomena has once been effected, then the ordinary laws (for the criteria of belief) operate automatically to cause facts and appearances to be accepted as real." Especially is this so in childhood. "The period of adjustments has not arrived, and the mind is very credulous." Experiences are then few; the knowledge of the life of relation in the world of reality is inadequate to the formation of just and accurate deductions. We take advantage of these conditions. By the power of our pure, untaxed and unstrained, and consequently stronger minds we at once, perhaps unconsciously, exert an influence which in a measure overcomes the natural resistance of a poisoned mental condition.

Some, having the power, trained by practice, carry this influence farther, to a state where the functions of the brain mass is partially or wholly paralyzed, conscience is narrowed down to a point where suggestions only are received, the so-called hypnotic condition exists. The technique of this condition I am not familiar with; its practice and its value (when carried to this extent) I leave to those more competent. As a novice, I only recognize, and so far as possible take advantage of "a certain proneness on the part of all people to allow themselves to be influenced by others through their ideas, and in particular to believe much without making conscious logical deductions." Also, that psychological and physiological effects tend to appear to a man if he is expecting them.

In the foregoing I think I have generalized sufficiently. I trust I have laid a foundation for some more practical suggestions from my experiences. In the near future I hope to present a paper upon some more special indications for systemic treatment, and which will in a measure be a sequel to this.

Without taxing you too greatly I found it impossible to embody all I wished to say in one reading. I would therefore ask you to follow me through the journals. Let me rest you, for the present, with the statement that what the specialty of dentistry needs to-day is broader dentists. With broader dentists we will have a greater profession; and in that broader and better allegiance into which the genius of the age evolves us, every good, conscientious, competent man will be an integral part of its glory. It is not enough that we do as well as we can to-day; we must get ready to do as well as we can to-morrow. "Humanity calls upon us in the sighs of suffering, in the moans of pain, in the agonies of despair. Every interest of sympathy that can stir the human heart appeals to us." Let us spare no effort to attain to the highest degree of proficiency.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

Regular meeting held October 6, 1896, the President, Dr. Louis Ottofy in the chair.

Dr. L. L. Davis read a paper entitled "Pulpitis."

Dr. P. J. KESTER: This matter of pulpitis is one that gave me a great deal of nervous disturbance in my earlier practice. There was no condition which presented itself to me at that time that made me think more, until I began to control it. When the dentist has a severe case of pulpitis with extreme pain he feels as helpless as at any time in his practice. I have learned somewhat how to treat pulpitis. I have found by experience and from information gathered from different sources, that the only way to treat pulpitis and to relieve the pain is to expose the pulp and let out some blood. Dr. Davis said that his treatment for pulpitis is arsenic. I should disagree with him. I think there are cases where it is necessary to preserve the pulp for some time. This is true with the anterior teeth of children, where the pulps are nearly exposed, and it is necessary to preserve them for some time. The tooth should be restored to its normal condition as nearly as possible in order that its full development may be attained.

The discovery of cataphoresis has made it possible for the dentist to allay the pain of pulpitis as nothing else has. I cannot agree with the essayist, however, that we can destroy a pulp successfully by cataphoresis. I do not believe that as a pulp destroyer, cataphoresis is a success. I have no new remedies or other procedures to offer.

A MEMBER: I do not know what use was made of the small piece of ice which was referred to by the essayist, whether to stop pain, or whether it was necessary to apply arsenic for this purpose. It reminded me of a case that came to me last winter. A man came to my office with a snowball in his hand and kept biting it little by little, perhaps to allay the toothache, and I had difficulty in getting him to discontinue the use of the snowball in order to adjust the rubber dam and apply arsenic to stop this toothache. I would like to have Dr. Davis explain what use he makes of the small piece of ice in the case mentioned.

Dr. CHAS. J. MERRIMAN: I may have misunderstood Dr. Davis as making the statement that in tapping a tooth there was

never any soreness or tenderness where there was pulpitis. It has been my impression in a number of cases, before operating that the tooth involved had a dead pulp, thinking that the accompanying tenderness indicated it, and I would find upon operating that it was a case of deep-seated pulpitis. Such cases I believe have been spoken of by Dr. Black, who is an authority on this subject. Dr. Black says, "If I am not mistaken, that in cases of deep-seated pulpitis, there is always marked tenderness which is often confused with apical pericementitis following the death of the pulp."

Dr. J. N. CROUSE: I do not think the essayist has touched upon the vital points of pulpitis. The important point is to diagnose the case. Pulpitis is the first stage of a dying pulp, and it is frequently difficult to locate. I allude to a case in which a number of teeth are filled, in any one of which you might suspect the pulp to die. The patient will have severe paroxysms of pain, hard to locate and increasing in intensity.

What are the symptoms of pulpitis, and how are you going to tell them? I have been able to locate pulpitis in one of two or three ways. My first method is to tap on the teeth and see which one showed tenderness, for, if you have pulpitis you usually have more or less tenderness on tapping. Then you can make an investigation and see if your diagnosis is correct. If so, you can isolate that tooth by putting the dam over it and apply cold water to test it for sensitiveness. If that increases the pain apply a heated instrument to the tooth. If pulpitis be present the patient will have an extreme paroxysm of pain. As soon as I found that I was on the right tooth I should drill in there and expose the pulp as quickly as possible, because it is only a question of a few days when the pulp will die. Of course, it may die and the pain pass away if you do not drill into the tooth, and the patient may not suffer enough to demand an operation. I think there are cases where the pain passes off when the pulp is dead. But acute pulpitis is the first stage of death, and I would relieve the pain as quickly as possible. If there is any place I could reach with a cataphoric apparatus, I would reach it.

Just before I started to attend this meeting a patient came to my office. He was suffering very much with toothache and had been in pain for two or three days. Some time ago I treated him for a severe case of abscess of the antrum, and ever since he has

located pain in the antrum. He knows where it is and is positive about it. I told him I did not care where he located the pain, but to tell me what his symptoms were, and he replied that he had sharp paroxysms of pain. I began to tap on a lateral incisor, and found that this was the tooth which had given trouble for three days. I drilled into it, passed a broach two-thirds of the way up quickly, secured free bleeding, and the patient was relieved. He had been suffering severely and I did not want him to suffer any more. After drilling in I applied some carbolic acid, partially killed the pulp, cured the pulpitis, and I expect to treat the cavity to-morrow morning.

Dr. DAVID M. CATTELL: About seventeen years ago when I was just commencing the practice of dentistry, a young lady came into my office. She was a country lass. She had been playing ball and was struck in the face by the ball and a bicuspid tooth was injured. Pulpitis immediately set in. By the time she reached my office there was intense pain, and, of course, there was inflammation outside as well as inside, but the principal trouble was with the pulp. I went down to a drug store underneath my office, procured two leeches, applied one; when it was satisfied it dropped off, I applied the other and withdrew all the excess of blood in the parts, applying the leech over the end of the root on the gum. This occupied about three quarters of an hour. Afterward applying locally a soothing lotion. A few days afterward the pulp and surrounding parts seemed well and I did not see her again for two or three years afterward. I saw her last within two years, and the pulp is still alive. It will respond readily to either heat or cold, and to all appearances it is as good a tooth as she has of the set. I think that oftentimes we have pulpitis from a traumatic injury or a blow, and that it can be relieved in different ways and the pulp still remain alive and regain its normal condition.

Often we may have inflammation of pulp tissue caused by irritants reaching the organ through a carious cavity, and the condition may have disturbed the pulp for one, two or even three days, and still that inflammation may be relieved and the pulp retained alive by careful treatment. I shall have to take issue with Dr. Crouse and others, and I am surprised to hear Dr. Crouse say what he did in regard to the case reported by him this evening. He has turned around wonderfully. It is only two or three years

since he was saving such pulps as he has told of removing to-night. I think his cataphoretic machine is doing him injury. He is playing with it too much.

Again, with reference to cataphoresis and the benumbing of the pulp and removal before liquefaction has taken place at the attenuated ends, it is impossible for him or any other man to remove a live pulp clear to the end of a tortuous canal without lacerating and leaving a portion in the apical end. And those are the canals from which it is difficult, even when liquefaction has taken place, to remove a pulp, and if he could see many of the canals that have been exposed in different ways and how peculiarly formed they are, he would know that he could not reach there to do the work even with the aid of his cataphoretic machine. If he could have seen, as some of us did last summer at Saratoga, some pulps reformed of a gelatinous matter, filling the original pulp canals, and then the tooth substance itself dissolved away and leaving that reformed body or mass the exact shape the pulp was in its original condition, he and every one else could see that it would be impossible to remove the pulp that was fast at the farther end from where you are working unless the tissue had softened, unless it could be removed in bulk without hinderance.

In regard to "deep-seated pulpitis," I cannot understand the term. Pulpitis is an inflammation of the pulp. Deep-seated, where? We cannot go any deeper. But if we have pulpitis of long standing the inflammation will extend through the apical foramen, and then we will have apical pericementitis, and by percussion we get a sensation, but so long as the inflammation is within the tooth there is no tactile sense whatever. If we have three pulps exposed on the same side of the mouth, whether upper or lower, or part upper and part lower, and the patient is aware of it we touch one of them, the patient cannot tell which one is touched. There is no tactile sense. If there is peridental inflammation, however, the moment we touch the right tooth we have the complaint of soreness.

Dr. C. N. JOHNSON: Since the recitation of cases seems to be in order, I will refer to one that I have recently had. It relates to the subject of pulpitis. The question has arisen as to the difficulty of diagnosing these cases. It is difficult sometimes to locate the pain. Patients frequently refer it to some remote point. A lady came to my office early in July saying that she was having trouble

on the right side, pointing to the interproximate space between the second bicuspid and first molar. She said the pain was located there. I made a careful examination and could find no cavity. The pain was not severe and I told her it was probably only temporary. While I was absent from the city she had a recurrence of the pain and had the tooth examined by some other dentist, and he was under the impression that there was a cavity in the first molar. However, she did not have anything done, and came to my office one day after I returned. She came in the midst of excitement and began to take me to task for overlooking a cavity and allowing her to suffer this pain. She pointed out the tooth which she thought was giving the trouble. She pointed definitely to the second bicuspid, I examined it, and could find no cavity in either the first molar or second bicuspid.

My method of diagnosing these cases is this: Instead of cold I use heat. I take a cone of heated gutta-percha which is tenacious, and better than a hot instrument. It will cling to the surface of the tooth. I applied this to the second bicuspid and she flinched. I said "Is that the character of pain you have been suffering." She replied, "No." I then went from one tooth to the other until I came back to the third molar which had a large oxyphosphate filling in it. When I applied the heat to it she flinched again, and exclaimed, "There that's the tooth. I told you all the time it was that one," and she put her finger on the second bicuspid. I drilled through the oxyphosphate filling and struck a case of pulpitis. I destroyed the pulp and this was the end of the trouble. This is another instance illustrating the fact that we cannot take a patient's word as to what particular tooth is giving trouble. We must find it out ourselves. The rule I follow is to test one tooth after another. The patient will flinch when a living tooth is touched, but it will not be the same character of pain that they have been suffering. It is momentary and passes away. But the moment you strike the right tooth, they will say, "That is the kind of pain I have been suffering."

Dr. J. N. CROUSE: I do not want to be understood as saying that it is my practice to kill every tooth which has an exposed pulp. I did not go into a full explanation of the case that I have reported to-night. I was dealing with the general run of cases, particularly those patients who come and call us out of bed at night in order to have their sufferings alleviated. Those of you

who do not have your offices in connection with your residences do not have so many cases of this kind. When a man comes to you suffering terribly with toothache you have to do something, either destroy the pulp or get rid of the pain. I have capped many pulps where there was toothache, and they were successfully capped. I was alluding to a filling where a patient came in and the tooth had been filled, yet there was some pulpitis. It is true in the early stages you do not get much resistance to pulpitis. You search around until you find the tooth which is causing the trouble.

Dr. C. P. PRUYN: The subject of cataphoresis has been referred to this evening, and most of the reports of its use have been favorable. I think it is only just that we should report our unfavorable results as well as the favorable ones. I have had two or three different instruments in my office and have thoroughly tested them. All of them connected with the street current have given trouble, and whether it is the fault of the wire that goes to our building, I do not know. The manufacturers of the instruments have failed to solve the trouble. I desire to report a case where I filled a labial cavity in a superior central incisor, the cavity being only slightly under the gingival border, the clamp placed in position, nicely exposing the cavity. I applied the electric current and the patient experienced some pain during its use. Upon the removal of the rubber dam I found that we had destroyed the gum tissue nearly half way up the root; we had burnt the peridental membrane, also leaving a portion of the alveolus exposed nearly one-quarter of an inch. Of course, this tissue sloughed after a little while, although we used the ordinary precautions to prevent it. I had the instrument maker try and find out what the trouble was, but he has failed to offer a perfect solution of the difficulty.

In another instance I prepared a cavity in the mesial surface of a molar, adjusted the rubber dam, applied the solution in a similar manner to the case just reported, and we had the loss of a large amount of gum tissue. I report these unfavorable cases so as to give you the benefit of the mistakes I have made, or rather the failures I have had in the use of the cataphoretic obtunder. If any of you can enlighten me so that this trouble can be avoided, I shall be glad not only on account of myself but for my patients.

Dr. DAVIS: How high was the voltage?

Dr. PRUYN: Not over fifteen volts.

Dr. CLIFFORD: What per cent solution of cocaine did you employ?

Dr. PRUYN: Ten per cent.

Dr. CLIFFORD: What kind of solution?

Dr. PRUYN: Aqueous.

Dr. WASSALL: Did it cook or dry the tissue so that it appeared like a carbolic acid eschar?

Dr. PRUYN: It had the appearance of a severe carbolic eschar.

Dr. CLIFFORD: Was the applicator attached to the clamp?

Dr. PRUYN: No. There was a clamp on the tooth, however, and the applicator was held in the hand.

Dr. CLIFFORD: Do you think there was any possible chance of the current touching the clamp?

Dr. PRUYN: It is barely possible, but I think not. The rubber holder came in contact with the steel clamp.

Dr. WASSALL: Where was the negative pole?

Dr. PRUYN: The manufacturer has been trying to find out, but he was not sure. I have had the wire marked so I would know in taking it off and putting it on which was the positive and which was the negative pole.

A MEMBER: What instrument was used?

Dr. PRUYN: The McIntosh. Then, too, Dr. MaWhinney has had several cases of electrical shock from the use of the cathoretic current. Everything would be going along nicely, when the patient would suddenly receive a severe shock. He has tried to insulate every part which he thought would come in contact with the chair. It looks to me as though a cell battery would be much more safe and reliable than to have the connection made with the street current. Several electricians say it is almost impossible to have the instrument connect with the street current and get satisfactory results. You know that our electric lights vary from time to time, they vary in intensity according to the amount of current used and turned off at some other points.

A MEMBER: Was it a case where the tooth was badly decayed?

Dr. PRUYN: No. It was only a small cavity on the labial surface of the central incisor, so that it was not necessary to reach up very high with the clamp.

Dr. DAVIS (closing): It is possible that I omitted some of the points in my impromptu talk that I had elaborated in my

paper. It is possible also that I left out some of the details of various points. I want to say in regard to the question as to the use of ice, that the case the gentleman has quoted was in all probability one of pericementitis, and not pulpitis. In the case of the gentleman who came into my office with a snowball, I used a small stick or pencil of ice in place of a jet of cold water, or in the place of heated gutta-percha. A small part of the ice attached to the end of the pencil is wrapped in cotton and applied to each one of the teeth in turn, without applying the rubber dam, and this will tell you very quickly which tooth is involved in pulpitis, and is an easier manner than if you were to apply hot gutta-percha. It is possible in describing the symptoms of pulpitis I did not go into the details sufficiently.

Hyperæmia is an acute, sharp, lancinating pain without any tenderness. Pulpitis is the same, but in the latter you get a dull ache which lingers after the paroxysm has passed. The paroxysms of pain are longer, but there is no tenderness unless you have in addition to inflammation the breaking down of the tissues and the development of gases of decomposition which result and cause pericementitis. A tooth does not respond to percussion in either hyperæmia or acute pulpitis, and so the cases that have been reported by Dr. Crouse and others have gone beyond the stage of inflammation and have resulted in suppuration.

NITRATE OF SILVER.

Dr. A. W. HARLAN exhibited specimens of teeth treated with nitrate of silver. He said: at the last meeting of the American Dental Association, held at Saratoga, Dr. Bethel, of Kent, Ohio, read a paper on "The Use of Nitrate of Silver for Filling Minute Root Canals by the Method of Cataphoresis." He made solutions of 10, 20, 30, 40 and other per cents of nitrate of silver and drove these into the roots by the cataphoretic instrument. In the discussion that took place, which has been published in the *Dental Cosmos* and *Ohio Dental Journal*, and possibly one or two other journals the statement was made by one speaker that he was afraid this would cause complete or partial discoloration of the tooth. Among others who took part in the discussion was your present speaker. I denied that this would sensibly discolor the interior of a tooth from numerous experiments that I had made, and finally the question narrowed itself down to one which was

stated by Professor Truman to be a question of veracity. I did not reply to that, as I think personalities in scientific debate are entirely unnecessary.

I hold in my hand a number of specimens that have been treated with nitrate of silver, not by the cataphoretic process, but by ordinary processes of making solutions from 10 per cent up to a saturated solution and using freshly extracted teeth (in the middle row on this card) to be dropped into these solutions and allowed to remain for from three to five or six days; then taking them out, simply washing them, and making a cut on the surface of the tooth, which you will see. On the first row in this card there are four roots that have been filled, the interior of which roots were first treated with from 30 to 50 per cent solutions of nitrate of silver and allowed to remain twenty-four, forty-eight, seventy-two, and ninety-six hours, and without cleaning the roots out or drying them, the root fillings were forced in and the teeth cut by Dr. Wikoff. They were all planted in plaster of Paris, so that the roots could not be seen. One in particular, a molar tooth, it was the only molar the roots of which had been filled, with an almost saturated solution of nitrate of silver on Saturday morning and allowed to remain until Tuesday afternoon, and cut down by Dr. Wikoff this morning. These specimens speak for themselves. You can see on the reverse side the intense blackening of the cementum, and on the specimens of root fillings, one of which has been filled with amalgam with the white solution of nitrate of silver is another. After a lapse of three months or a little more it does not show appreciable discoloration. I have one specimen more than three years old, and I have other specimens which were made in September, 1894; I pass them around simply in the interest of accuracy of observation. These teeth were all moist. Those not freshly extracted were previously soaked in water for days, so that they became thoroughly moistened. I do not think that you used dry teeth at all, did you, Dr. Wikoff?

Dr. WIKOFF: Not in any of the specimens I worked on.

Dr. HARLAN: One of the specimens I made was kept in moisture and stayed there between two and three months, being looked after by my son. He wanted to fill the root of that tooth, and it was kept in a jar to see whether any change took place. I am not advocating the fillings of roots of teeth with nitrate of silver. I simply show the results of the silver on the enamel, dentine and

cementum, and under the circumstances I have related nitrate of silver, as you know, as soon as it parts with its oxygen ceases to be nitrate of silver and deposits the oxide which in time is converted into metallic silver, not wholly but partially. Oxide of silver is not a penetrating agent. Nitrate of silver, as any one would know from looking at a photographer's fingers is an agent that is self-limiting, that is, it will penetrate a certain distance and then stop on account of the formation of the oxide, which prevents its further penetration.

Dr. CUSHING: You have not tried cataphoresis in these cases?

Dr. HARLAN: Not in these specimens.

Dr. CUSHING: Have you tried the application of nitrate of silver by cataphoresis?

Dr. HARLAN: Not experimentally. One of the teeth, by the way, is cut transversely, a molar crown. I cut that off and it exposed both the dentine and enamel, and you can see slight penetration in that case. This was treated with nitrate of silver just as soon as it was taken out of the mouth.

INCIDENTS OF OFFICE PRACTICE—A CASE OF PYORRHOEA ALVEOLARIS.

Dr. C. N. JOHNSON: I desire to relate a case where the patient was salivated some twenty years ago, and his teeth since have frequently troubled him more or less, not with any discharge from the gum, but occasionally a certain tooth would be attacked with calcic abscess. Through those abscesses he has lost three or four teeth. I have had him under my care for about eight years, and for the last four or five years his teeth have been comparatively comfortable. But this summer he went down to French Lick Springs and stayed there ten days. He drank the water, and that apparently brought back his old trouble; that is, all of the symptoms of salivation returned. The gums became inflamed, the periodontal membranes very sensitive, and the gums bled profusely in the morning on rising. His teeth were excessively sore in the morning. I gave him a sitting last week and searched for calculus, but did not find very much. I gave him a treatment, using iodide of zinc. He reported yesterday that his gums were in very much better condition. There has been no bleeding since the treatment. The soreness is gradually subsiding and he is feeling quite comfortable.

The question I desire to raise is this, What was there about

the water, if it was the water, that brought back the old trouble? The trouble is apparently easily controlled, but it was evidently a recurrence of the old difficulty.

Dr. WASSALL: Is he taking calomel now or any mercurial preparation?

Dr. JOHNSON: No. He is taking no medicine whatever.

Dr. OTTOFY: I have noticed the same thing Dr. Johnson refers to. Having sent a patient to West Baden the disease returned. The man came back much improved in general health and was apparently in good condition, but the diseased condition of the gums returned. At the time I was puzzled very much, and I did not understand why that should be.

Dr. W. H. TAGGART: I think you will all admit that for soul-stirring and sweat-producing conditions there is nothing that will take rank with the preparation and filling of buccal cavities in lower molars and bicuspid, and the labial cavities of the central incisors and anterior teeth. There have been a great many clamps devised for this purpose, but it has seemed to me they fall far short of the one thing, and that is, to reach exceedingly bad cases. Those clamps that have been invented will reach the ordinary case and Dr. Dunn's recent clamp goes a step farther than any of the others; but still there are a class of cavities, taking molars in particular, that the clamps on the market will not reach. I have devised something and have been using it recently, which I think will serve the purpose. I have used the form for some time, but more recently I started to perfect the idea because I felt it was a very excellent one. I have samples here of the different kinds of cavities with rubber dam on, and I will now explain briefly the process with its results, then pass the models around and allow you to get ocular demonstration.

I take small tempered steel wire and form it into little wedge-shaped points similar to a hatchet excavator tapered flat toward the point. These vary from one-sixteenth to one-eighth of an inch long. These wedge-shaped pieces of steel are too small to handle with pliers and to put them in the difficult positions in the mouth which we have to contend with. So I have taken a plugger point and in the end of it have bored a small hole half the depth the pin is long, so as to form a pocket for the pin to be held in. I then magnetize this point, and the magnetism holds the very small steel wedge into the hole with no danger of its dropping out. It

holds it firmly in the end of the piece. I then put the rubber dam over the tooth, and with the little point in the instrument draw it down until I get to a firm point well below the margin of the cavity in the cementum, and when I get it in a firm position by giving one blow or two I drive the wedge-shaped point into the cementum. At first thought some one would say that this would injure the cementum; but the fact that you are able to get it down there and are able to put in a perfect filling and finish it properly, more than outweighs any apparent injury which you may do to the tooth. You can do no injury anywhere, because it is well beneath the gum, and the pericementum is elastic enough to close the wounds. I have a tooth in my office which I have punched in there a hundred times, and Dr. Newkirk tried yesterday to find the defects. It does not show any blemishes. Take a tooth only filled once, we can do no possible injury to it. The lingual surface of the tooth does not need any clamp. This explanation is best demonstrated by passing these samples around, which I will now do.

Dr. JOHNSON: I would ask Dr. Taggart if he contemplates putting these little appliances on the market. I think they will help us out in a great many cases.

Dr. TAGGART: It is my intention to do this if the profession approve of them.

Dr. J. W. WASSALL: I am surprised some one does not point out the dangers which may result from the small holes that these points would surely make. While we must all bow to Dr. Taggart's ingenuity in devising a method for holding rubber back in these difficult cases, we must not lose sight of the fact that a small lesion has been made which invites the formation of a new cavity. Decay only begins in a tooth where there is a place for the lodgment of microorganisms that produce lactic acid, and there certainly is a chance in these little punctures in the cementum for the microbes to develop. The only cases in which this idea can be used without danger would be where you are going to crown, when the holes would be covered up by the band, or where the little points would be driven through the living peridental membrane; for in the latter case I can conceive that the pericementum would fill up the little crevices again. I think, however, it is a hazardous method to adopt for regular practice.

Dr. D. M. CATTELL: I think Dr. Wassall is unnecessarily

scared about the injury—temporary injury we might call it—to the peridental membrane and cementum by these needles of Dr. Taggart. We know that of all the tissues of the teeth, there is none so easily repaired from traumatic injury as those mentioned. The cementum being more nearly like bone than any other of the tissues of the tooth, after an injury, it is usually repaired. The peridental membrane can be lacerated and wounded wonderfully with the disk, and with this, that and the other thing, and yet it will heal readily, and unless pus forming microorganisms be present, there is no injury done of any consequence to the peridental membrane or the cementum.

Dr. C. N. JOHNSON: Dr. Taggart made a point that I was going to make in regard to the general application of this method. I have not tried it in the mouth; I have seen it demonstrated out of the mouth, and it appeals to me as a good idea. So far as injury to the cementum is concerned, I do not believe it will injure the cementum in the hands of a careful operator. I think Dr. Taggart explicitly referred to the possibility of an injury in his opening remarks, and that is why I have not said anything about it. I do not believe a small hole, such as one of these little pins would make in the cementum, when covered perfectly with healthy gum, will invite caries. I want to say this, that there are some cases we have to operate on where, if there was an alternative between injuring the cementum slightly and putting in a good filling, I should take the chance of injuring the cementum, and make an easier operation and put in a perfect filling. I certainly think this method is worth trying, and I hope the gentlemen will test it and report on it.

Dr. J. N. CROUSE: I recollect very distinctly that Dr. Atkinson advocated the use of small gold wire for this purpose, making a slight thread, after you are through cutting it off close and leaving it short. This method I have adopted a few times in extreme operations. I have never found anything quite as good as an instrument I could hold in my left hand when at work, and I use that in preference to a clamp or anything else. I have my instruments made of different shapes that I can hold. Now the demand comes in for something to secure the dam without holding it with the hand. When we are applying a current of electricity we want our hands free; although it is not necessary to stand and hold the apparatus. Take German silver wire, small and fine, and roll it

around cotton large enough to pack it in a cavity and stay there, then apply cocaine, turn on your current of electricity, and you can read a newspaper or do something else in the meantime.

I have been working along this line for some months. I was impressed with the importance of having something to hold the dam in these cases instead of a clamp. The wire comes in contact with the clamp and the current of electricity is carried off somewhere else. I venture the proposition that there is not a practitioner of dentistry but who in a year from now will be using this method of painless dentistry. It is an absolute success.

Dr. GEO. H. CUSHING: I want to say one word with regard to the objection Dr. Wassall urged, and I cannot see that that is necessarily a good objection. Of course, we have not had the experience to determine it. I consider that for a certain class of cases this is the most perfect apparatus for the purpose intended of anything that we have had. I am reminded that many years ago I used, perhaps in four cases, very small gold wire screws for the same purpose. In the cases that I had the opportunity of watching for many years after, there was no mischief apparent from their use. Where the gum will cover the points that are attacked by these pins or needles, I cannot conceive how there will be any danger of decay occurring at these points by reason of the injury to the tissues. The injury must necessarily be very slight, and if protected by the gum there will not, I think, be any decay at that point.

Dr. J. H. WOOLLEY: It seems to me that these needles might be made of some kind of material that would answer the purpose of steel and of that nature that they could be driven in sufficiently firm, without their being allowed to remain there, clipped off, smoothed down, and that is the end of it.

MINNESOTA STATE DENTAL SOCIETY.

DISCUSSION OF DR. JONES' PAPER ON CATAPHORESIS. BY DR. H. O. LARRABEE, WINONA.

I approach the discussion of cataphoresis with a great deal of reluctance. Possibly you will remind me that I am to discuss this paper, and incidentally, I will, but what you and I are interested in at this stage of our proceedings is, whether cataphoresis as a theory is to become practical. I am very glad to say I am pleased

with this paper. I am not conservative in the fullest sense—am a little inclined to be “a crank.” I have been in the dental profession for thirty-five years. All through these years I have been searching for that thing that I could use in practice to make dentistry as agreeable as possible to my patients. My attention was called to cataphoresis early in the year, I think the first paper I read was one by Dr. Gillett, and after that by Dr. Morton, and I have been a student of Dr. Gillett and Dr. Morton ever since, and I believe the principle they advocate a good one and will bear investigation. It is a good thing we have shining lights in the profession willing to stand out and take a prominent position in certain lines and follow them out to their completeness, of such are Drs. Gillett and Morton. Dr. McGraw did much in the way of bringing this matter before the public, the only regret is that he didn’t follow it out. You understand what the term means, downward travel, diffusing a medical property, this we have in cataphoresis. The doctor has called attention to his experiments and results and failures. It would be no more than proper for me to give you my experience in this line, although I have only kept a modified account of them.

With cataphoresis as with cocaine or any other pain obtunder, a heap depends upon the man who uses it. I remember very well when our first pain obtunders were introduced, nine-tenths made a failure. I was one of the original experimenters with cocaine and made a success, extracting twenty teeth without pain.

One of the State Board of Health saw my success. I could tell you results that were unfavorable. I could tell you of reports in some of our medical journals, unfavorable, but that didn’t hurt cocaine, neither can failure in the use of cataphoresis by my medical brother hurt it. It is a fact that cataphoresis is a living, vital force in the practice of dentistry and has come to stay. I never have had failure in the use of cataphoresis since I put it in my office three months ago. I have used it in as nervous cases as the State of Minnesota, (prolific in sources of nervous weakness) could bring. I know ladies who had been in my office for hours, unable to be treated and I have had the same ladies sit there enjoying the process—just as much as it is possible to enjoy sitting in a dentist’s chair. I am willing to believe we are standing on the threshold of new discoveries in the modes of application of electricity to our needs and I wonder, thinking of what the unfolding decade will

bring to us. I was thinking the other day along this line. This may illustrate to you my conception of the present relation of electricity to medical practice.

I was going along Broadway and beside a hydrant I saw a little two-year-old child on the threshold of discovery if you please. I suppose he had seen people turn on water from the hydrant and he walked around and finally got his little fingers upon the tap of the hydrant, eyeing it and finally began to turn it and soon water began to run out, and there he stood in wonderment. He saw but a round post and by a little application of his fingers water gushed out, and presently his little feet were immersed. He stepped over and around, he looked at the hydrant and then at the stream and then got down to look and see where the stream came from. The intelligence was gaining knowledge. The new discovery made its impression upon the child and he was beginning to perceive there was a power there. That is the idea in regard to cataphoresis. We have electricity, it has been chained and brought to our doors and we are becoming masters, but if not intelligent masters, it will begin to submerge and perhaps drown us out, but if intelligently handled it will prove of marvelous power for good.

I want to speak of the failures the doctor alluded to on the posterior and labial cavities of wisdom teeth. He says you are not able to use the rubber dam there. I am not one of those so constituted, but there are men in the profession who say no tooth or cavity is so obscure but that the rubber dam can be applied. We don't like to own it but lots of you fellows make failures in trying to adjust the rubber dam. I don't believe it is necessary to adjust the rubber dam to make a success of cataphoresis. I believe you can apply it without the rubber dam. Not as well, because the moisture will penetrate and mix up with the chemical properties and possibly modify their strength. A proper electrode is very essential.

There is another thing. The doctor alluded to obtaining fractions of a volt. The name "Wheeler's volt selector" is possibly misleading. A continuous current is necessary for easy application of electricity. I know that jumps and hops from volt to volt are not very pleasant. We need a volt selector that will carry the current from zero to where its strength becomes felt in the tooth and then its application is so gradual there will be none of the difficulty of which the doctor speaks. I have observed the same

thing. I suppose time will remedy that. I think the oldest and wisest of you will admit there is something in hypnotism in dental practice. I don't want two hours to administer cataphoresis. I don't want to be in my operating room alone. I don't care how much business I have—the more the better. I use my volt selector in this way: I find my cavity, adjust my dam, apply my electrodes and put them into the hands of my young lady assistant and go about my business. At the expiration of fifteen minutes I take the patient and prepare the cavity. I don't ask if it hurts. I say, "Here I have a harmless painless method by which I can handle your teeth without a particle of pain" and I prepare the cavity, introduce the filling and finish it up and ask, "Did I hurt." The usual reply is, "No. I never had such a delightful operation in my life." About the toxic effects. I never had any. I won't say there may not be such a thing, but I say Dr. Morton has never found any, nor Dr. Gillett. I can but affirm what the doctor has said about removal of pulps by cataphoresis. You may question my wisdom in the operation I will describe, but that isn't the matter under discussion. I had a young lady about eighteen years of age, with defective teeth, syphilitic. She asked if the operation would be very painful. I said "I will give you chloroform while I cut off the tooth and take out the nerve, so you won't feel it." Some six weeks previous she had had lung fever and her lungs were in bad condition. I had her examined and the result was that it would be improper to give her chloroform and my only resort was cataphoresis. I approached the case with a great deal of trepidation and hardly believed I could do anything with it. It had to be done. I cut a small cavity in one of her teeth, introduced a small pellet of medicated cotton, applied my electrode and turned on the current until it reached about forty volts by the selector and disconnected; found tooth very sensitive. I tested my selector and found I was using the negative current instead of the positive, and got no results. I applied it again for about fifteen minutes with the positive pole in the cavity, then cut in, expecting there would be trouble. I was very cautious in removing the dentine so as to make the cutting operation when I came to the nerve as rapid as possible, and when well prepared, I got a very sharp bur and cut into it. The whole operation was eminently successful. I am using this almost every day in my practice and never have had a failure. I don't care what tooth you present to me, I am

very sure I can handle it in a satisfactory way to myself and to my patient. I know there is a percentage, possibly prejudiced against anything of this kind, as I am not working in the interest of the Wheeler volt selector or any other organization, what I say to you ought to have its influence. There are those who don't care. I believe that is true. I believe there are dentists (not here) in other States, Wisconsin, Illinois, perhaps States far away, who don't care how much they hurt if they succeed in getting the job done quickly and getting their money. To such a one there is no use in cataphoresis, but to one humane from the bottom of his heart, desiring to perform operations painlessly, it is fully worth the trial, and I am very sure that one who can manipulate the appliances properly will get from them the same results that I have.

I thank you very kindly for your attention. I am very sorry I am not better posted in cataphoresis. I don't know much about electricity, but I feel it is a mighty power and if you try it, it will repay you greatly.

[TO BE CONTINUED.]

The chemists and druggists are banding together in Great Britain to test their right to extract teeth and do other dental work for the dear people. A few barbers extract teeth in England also. Why not have them give in this praiseworthy (!) undertaking.

INCOMPATIBLE WITH ANTIPYRIN.

According to the *Phar. Centralblatt* the following substances precipitate antipyrin from aqueous solution: (1) Phenic acid in concentrated solution; (2) tannin and tannic acid preparations; (3) tincture of iodine; (4) chlorides of mercury. The following decompose antipyrin when triturated with it in a dry state: (1) calomel, forming a toxic combination; (2) beta-naphthol; (3) chloral, which forms an oleaginous liquid; (4) bicarbonate of soda (an acetic ether odor is given off); (5) salicylate of soda, also forming an oleaginous liquid; (6) the salts of quinine and caffeine, of which the solubility is increased by antipyrin.—*New York Medical Record*.

LORETIN VERSUS IODOFORM.

The comparative results in the treatment of suppurating surfaces are stated by Dr. W. O. Green as follows: 1. Loretin is without odor. 2. It is slightly more stimulating, and causes more pain perhaps when first applied, but is shortly followed by more permanent analgesic effect. 3. It has greater antiseptic properties, and on this account, limits and then diminishes more rapidly the local inflammatory condition. 4. The process of granulation is more rapid and more perfect. 5. The local alterative effect is greater, and therefore the part requires less supplementary treatment in the way of local applications. 6. The discharge diminishes more rapidly.—*Am. Therapist*, September.

THE DENTAL REVIEW.

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WHY THE WORLD DO MOVE.

In reading over the report of the discussion on Dr. Bethel's paper read before the American Dental Association and now published in the *International Dental Journal* we find that the editor clings to the idea that it is a question of veracity between himself and the editor of this journal. We will quote what he says and what our reply was, as well as his rejoinder:

"Dr. JAMES TRUMAN, of Philadelphia: The importance of nitrate of silver, to me an entirely new agent for the purpose intended, seems to require more consideration than has been given to the matter. It is true that nitrate of silver will prove a powerful antiseptic, and will prevent microorganisms from developing; but, at the same time, we all know from the previous use of this agent that it will discolor tooth substance. It does not require any assertion or any further experiment. It is as old as dentistry. If it be carried into the tooth through electrical osmosis, where are the limitations? Can it be controlled at the neck of the tooth? Will it be confined to the tubuli of the teeth? I think not, if we have any evidence from past experimentation. Experiments with nitrate of silver in tooth substance have demonstrated that it does not require electric osmosis to carry it into the tubuli of the tooth. I have carried it there by simply placing a saturated solution in the root canal, and the entire dentine has taken it up, and the tooth has become thoroughly discolored. This I demonstrated in a series of experiments that I gave to the profession over a year ago. (*International Dental Journal*, January, 1895.) When we recollect that we have between the so-called tubes of the teeth minor tubes,

and that these run in every direction throughout the tissue, it is surprising that any one could suppose that this action could be limited. These are important matters. When a question of this kind comes up before this body it ought to be answered, because it contains within it dangerous possibilities. If it goes out from here without a protest many men will experiment with it, and teeth will become discolored. I do not see or understand how they can limit it. If we must have something to penetrate the tubes of the teeth thoroughly, to coagulate them, why not use chloride of zinc? (Applause). We all know what that will do; it will not discolor. We found that out early in the history of the profession. Why take, then, an agent that we know will discolor and place it in a tooth in that most dangerous of all positions, the canal? We are, in my opinion, on the wrong line of experimentation when we take such an agent as this for the purpose described. I know very well from my own experience in the mouth and out of it that chloride of zinc will do the work. I would not dare to carry it in by cataphoresis, because chloride of zinc is an escharotic, and an escharotic must be handled carefully; but you can cause it to penetrate the canal by imbibition, and it will coagulate the contents of every tube in the tooth. I have carefully examined sections thus treated, and there can be no question as to the result. What does nitrate of silver do? It is one of the best coagulants we have; but chloride of zinc is a better one by far, and you can get the same effect from oxychloride of zinc. Place it in the canal in thin mixture, and you get better results than from any agent I am familiar with.

Dr. HARLAN, of Chicago: I did not hear the first paper, and hence will not discuss it. The second paper, relating to the treatment of minute root canals with nitrate of silver directed cataphorically, I believe is the subject under discussion. From a somewhat extended experience in experimenting with teeth planted in plaster of Paris and paraffin and wax, and from some practical experience with teeth implanted in jaws, I would say that solutions of nitrate of silver do not penetrate the dentine of such teeth to any appreciable extent as to cause a discoloration which would become disfiguring. Dr. Taft made the correct statement about the decomposition of nitrate of silver, and it is only by continued force of the electric current that the decomposed nitrate of silver or oxide of silver can be driven to any extent into the dentine. The specimens that were shown here demonstrate that the oxide

does not reach the cementum, because it becomes deposited so thickly that it prevents the further discoloration. I have in my possession a number of teeth that have been treated with nitrate of silver solutions, planted in plaster of Paris in 1894, but I shall open them soon and make a report on them. I have any number of teeth planted in plaster of Paris and paraffin and wax with various kinds of oils and coagulating agents. A good many of them I have reported on at different times. Dr. Truman says that chloride of zinc will coagulate the tubes or the contents of the tubes, etc. If it does, why does it not injure the cement if the tooth is alive? Chloride of zinc is one of those self-limiting coagulants of albumen. There have been no experiments so far that have proved that chloride of zinc penetrated through the dentine of a tooth. I saw Dr. Truman's experiments, and I do not think they penetrated at all. Chloride of zinc, as soon as it satisfies its affinity for water, stops; and the fear that was expressed by Professor Abbott, that the nitrate of silver would be driven through the ends of the roots is simply imaginary, because as it is driven through the end of a root and comes in contact with the soft tissues and forms a coagulum, it will not go any farther. On the end of my finger, now, I have nitrate of silver, which got there accidentally Saturday of last week. It is full strength, too. This is not a kindergarten association. The question that will be brought up by the section of materia medica and therapeutics tomorrow morning will bear more on this subject, when I will have something further to say; but I want to disabuse the minds of some of you of the thought that nitrate of silver will permanently discolor the dentine of a tooth, because it does not.

Dr. TRUMAN: This discussion has come down to a question of veracity. Dr. Harlan absolutely said that it is impossible to carry nitrate of silver into the dentine. I say just as dogmatically that it is possible to carry nitrate of silver into the dentine, almost up to the cementum. Now, which will you believe? It is a question of methods. I can substantiate what I say. He says further, that chloride of zinc will not coagulate through the tubuli of the tooth. I know it will. Now, you can believe me or not. I have made section after section, after the treatment with chloride of zinc, and have traced it up to the peripheral distribution of the tubuli. These were not exhibited at the meeting described by Dr. Harlan, for reasons then given. Those who saw the tubes ex-

hibited know that I carried it through the most minute tubes, in spite of his assertion that coagulation could not take place beyond the mouth of any tooth. Nitrate of silver, chloride of zinc, in fact all the agents demonstrated satisfactorily proved this. Now Dr. Harlan comes here and says it cannot be done. Let him prove to the contrary. You have simply his word, and my word, I take it, will go as far."

You pay your money and take your choice. By reference to the report of the Chicago Dental Society in this number it will be seen that the editor has presented his case.

Any one who has used nitrate of silver for the correction of sensitive dentine must know that Ag. NO_3 does not penetrate deeply; indeed, the late Dr. Stebbins, whose claim to originality in the use of nitrate of silver for the arrest of caries of children's teeth, is vouched for in the November issue of the *International*, presented his cases at Saratoga, 1889, and these cases showed that the stains were only superficial. This is a question which any one can test for himself and the question resolves itself into an error of observation on the part of Dr. Truman. He, be it said, being convinced of the truth of his observations through the assumption that discoloration—superficial is penetration. We leave the question to our readers who may experiment for themselves.

THE CHICAGO DENTAL SOCIETY.

The oldest and largest organization of dentists in Chicago. For several years we have published the papers and proceedings of this body, and we note with pride that the work being done is growing better year after year. It is about time that an annual clinic should be held to demonstrate to the members and visitors that all practical methods are used in this great city by this progressive body of dentists. This might consume two days some time in February next, and at the close a dinner might fitly close such an entertainment. St. Louis held two or three very large and successful clinics two or three years ago. If the Chicago society should conclude to undertake this work papers might be read each day to add to the interest of such a series of clinics. When will the committees be appointed to do this work? (The committee has been appointed).

DENTAL LEGISLATION.

With the election of a new general assembly an effort should be made to amend our present dental law. At the May meeting of the Illinois State Dental Society a committee was appointed to take this matter in charge. From what knowledge we possess on the subject of the working of the present law we should say that a few amendments are necessary. First, to provide for the enforcement of the law. Second, to provide funds. Third, to require all persons to be graduates. Fourth, to change the word "persons" to "citizens," and fifth, to secure an annual registration which will provide the funds. Sixth, to exempt dentists from jury service. Any suggestions to modify the present law will be appreciated by the committee which is composed of Drs. C. R. E. Koch, Chicago, L. L. Davis, Chicago, and E. K. Blair, Waverly, Ill.

EXAMINATION OF THE MOUTH FOR PATHOLOGICAL LESIONS.

Dr. W. C. Barrett has made a suggestion about the duties of demonstrators in dental infirmaries which we heartily commend. His idea is that all patients should be examined by a demonstrator to discover and point out indications of disease (other than caries) in all of the mouths of infirmary patients to be an object lesson to the student. If the senior classes were divided into divisions of six or eight let them rotate from day to day until each and every one could see all the phases of disease in each mouth until they become thoroughly familiar with all external (mouth) lesions. The time of a clinical instructor could be well spent in work of this character. As an aid we might offer a suggestion: When the patient is seated the mouth should be washed thoroughly with a 2 per cent boro-glycerin solution made with warm water. The mouth glass should be immersed in a solution and all probes or points used in the mouth should be similarly treated. Thread should not be used between the teeth more than once when pus or blood oozes from the interspace. If a pyorrhœa pouch is explored with a probe it should be sterilized before introducing it into another pouch or beneath the gums for fear of infection. By being careful a great object lesson could be prepared for the student daily which would be of immense advantage to him in infirmary practice as well as after he has left the college halls. Will you try this messieurs demonstrators?

REVIEWS AND ABSTRACTS.

GESCHICHTE DER ZAHNHEILKUNDE, vom Jahre 3,700 v. chr. bis zur Gegenwart, von G. P. GEIST-JACOBI, Doctor Dentariæ Medicinæ und Zahnarzt zu Frankfurt a M. Tübingen: Verlag von Franz Pietzcker. 1896. (History of Dentistry from 3700 B. C. to the present time. By George Pierce Geist-Jacobi, D. M. D., Dentist at Frankfurt-on-the-Main.)

Appearing at this time when there is an abundance of so-called dental histories from the pens of American writers, this little book from the pen of Dr. Geist-Jacobi is very pleasant. Unfortunately, history should not be written until the ripeness of age is sufficiently remote from the influences of personal equation to make merely historical record of truth and fact. For that reason some recent histories, full of local and personal reminiscences, are comparatively worthless. Some have, in addition, made unreliable records, and are for that reason unreliable. Even Geist-Jacobi, careful as he was, has permitted local and national pride to mar some of his pages.

However, the chapters devoted to ancient history, beginning with 3700 years B. C., to Egyptians, Hebrews and Greeks, then through Romans down into the middle ages, passing through Arabic history to the modern development of the last four centuries are true historic records. It is only when we come to consider the most recent period of the development of dentistry, namely the close of the nineteenth century, that we find the historian meeting with the difficulties of making reliable historic records. Of course, we must be pardoned if we think that our own country has not received full credit. We believe that an Englishman or Frenchman would feel likewise, while a German ought to find no fault with the credit given to contributions made by representatives of the profession of his own country. As previously stated, these are not personal faults to be ascribed to an author, they are the inseparable difficulties met with in the writing of history.

Geist Jacobi's book is by all means the most valuable addition of its nature, and its appearance is hailed with delight. It is printed in the faultless style of the German book maker, on good paper, wide margins, some few illustrations, 254 pages, 8vo, and enclosed in that flexible cover so much favored by the Germans,

and so pleasant to handle. It may be obtained through the publisher, Franz Pietzcker, of Tübingen, Germany, at 6 marks per copy. L. O.

MEDICO LEGAL DECISION. No. 2 jury court. (Before Mr. Justice Cohen and a jury of four.) Neal V. Hodgson. (Part heard.)

Mr. Edmunds (instructed by Mr. R. H. Levien) appeared for the plaintiff, Theresa Neal; Mr. Wise (instructed by Mr. W. P. Crick) for the defendant, Charles George Hodgson. This was an action for the recovery of £2,000 compensation for injuries alleged to have been caused by a dental operation. It appeared that plaintiff went in June, 1894, to defendant's place in Macquarie street, to have a tooth extracted, and was operated upon, she believed, by one of his assistants. The first attempt to draw the tooth resulted in its being broken, and caused plaintiff great pain. A second attempt met with no better success, and plaintiff left, after being told to come back on the following Monday. This, however, she did not do. After the operation she said she suffered great pain, and had eventually to submit to operations at Prince Alfred Hospital. She claimed that defendant had been guilty of negligence and unskillfulness. The defense was that there was no negligence, nor unskillfulness, and that the cause of the operations to which plaintiff had had to submit, was not the drawing of the tooth. The case was concluded on Friday, except for his Honor's summing up, which was delivered yesterday.

His Honor, in summing up, said the jury would have to find that the plaintiff had suffered injuries, but that these injuries were the result of the negligence of the defendant or of his assistant. There was no doubt that the patient had suffered a great deal in one way and another. She had been a patient in the Sydney Hospital before the operation, and had since been in St. Vincent's Hospital and at Prince Alfred Hospital; but, although the tooth was drawn on the 9th or 10th of June, the swelling of which she complained did not exhibit itself until about the 14th September. She contended that the pain she had suffered was the result of the operation not being skillfully and properly performed. Several medical men had given evidence in the case, and all of them, without exception, had said, that had the swelling resulted from this operation, it would have declared itself much earlier. Their evidence was to the effect that it would have shown itself within a

week or so afterward. As this swelling did not make its appearance for about three months afterward, the medical evidence went to negative the supposition that it was caused by unskillfulness in the operation. It was true that five months after the operation Dr. Twyman removed a large piece of dead bone from the jaw, but there was no evidence to show that this dead bone was the result of the operation. There were numbers of cases in which operations of this kind might be skillfully performed, but in which the general health of the patient might be such as to retard progress, and serious, instead of improving, results might be brought about. They had to say whether there was any evidence that the piece of bone became dead through the operation in Mr. Hodgson's rooms, or that the person who carried out the operation had performed it unskillfully. There was not, in his opinion, a tittle of evidence on the part of any of the witnesses to show that the operation had been unskillfully performed. The failure of the plaintiff to return to the surgery on the Monday following the operation could not, however, be brought against her as contributory negligence, but it was for them, as reasonable men, to say, if they thought that the evidence in the case would justify them in coming to the conclusion that this operation was performed with want of skill, to what amount of damages the plaintiff was entitled.

The jury, after a short retirement, brought in a verdict for the defendant.—*Sidney Paper, N. S. W.*

THE AMERICAN TEXT-BOOK OF PROSTHETIC DENTISTRY IN CONTRIBUTIONS, by eminent authorities. Edited by CHARLES J. ESSIG, M. D., D. D. S., Professor of Mechanical Dentistry and Metallurgy, Department of Dentistry, University of Pennsylvania. Lea Brothers & Co., publishers, Philadelphia, 1896. Price, cloth \$6.00, leather \$7.00.

In presenting this book to the teachers and profession the editor has succeeded in producing the best arranged and most satisfactory text-book for the use of students that has as yet appeared. It is equally valuable as a book of reference for the practitioner. It should be in the hands of all, as this department of practice has been sadly neglected. If such a work is consulted more extensively a new interest will be awakened in dental prosthesis, and a higher class of operations will be the result.

The method of its compilation is to be especially commended.

The contributors are men of long practical experience. They have also been accustomed to the application of both theory and practice for the benefit of students, and are eminently fitted to discriminate as to what is correct practice at the present time. The volume is not loaded with useless and obsolete methods.

Much of the matter is entirely new and yet the methods discussed have been carefully demonstrated as both practical and simple. Yet, as is stated in the preface, simplicity and ease of manipulation is not the prime object; but accuracy and carefulness as to detail is the main factor throughout.

It will be observed that six of the eight contributors are actively engaged as teachers in the dental schools of the country, which marks it as a standard book of authority upon the subject treated, and may be considered as the title indicates, the "American Text-book." The other two contributors are men of well-known ability as writers and authors.

Chapter I., by Dr. Essig, is devoted to a good description and illustration of laboratory appliances. Something very much needed both for the novice and expert.

Chapter II., by the same author on metallurgy, has been carefully revised and much new matter added, which will develop a new interest in the subject.

Chapter III., on principles of metal work, and Chapter XIV., on cast dentures, by Professor Goddard, of the University of California, show distinctively his painstaking care and attention to detail as well as correct discrimination as to the matter submitted. We cannot refrain from complimenting his efforts as a representative of the "far west."

Chapter IV., by Professor Essig, on moulding and carving porcelain teeth is most beautifully illustrated and well arranged. This* subject is not so important in general, yet it is not out of place in a work of this character.

Chapters V., VI., VII., VIII. and IX. are by Dr. Burchard, relating to the processes of preparing, the taking impressions, making dies, models, etc. While in some parts the conclusions and statements could be justly criticised, the subjects dealt with are so well presented that it is not called for at this time.

Chapter X. on the bite or occlusion by Prof. Grant Molyneaux, of the Ohio College of Dental Surgery, is worthy of especial mention, as so much of the matter will be entirely new to the profes-

sion, and yet upon its first reading will be commended as thoroughly practical and we are sure must be considered as indispensable to the student, the teacher, and above all, to the practitioner.

Chapter XI., on the selection of the teeth, attachment to the plate and finishing, is most carefully considered and presented.

Chapter XII., on the use of English tube teeth for crown and bridge work, is essentially the same as presented at the World's Columbian Dental Congress, by Dr. John Girdwood, of Scotland. While it is an able production the methods are not likely to be adopted to any great extent in America, owing to the difficulty of securing all the necessary adjuncts to make it satisfactory and on account of the lack of familiarity on the part of the American dentist with the use of the tube teeth in any process. There are many operations in which the method is valuable, could the objections spoken of be overcome.

Chapter XIII., continuous gum dentures, undoubtedly no one could have been selected, who would have presented this subject in better form.

Chapter XV., on vulcanized rubber as a base should be most carefully read and remembered. It is a wholesome chapter and it is to be hoped will be the means of improving the general practice and relieve it of the almost universal carelessness on the part of practitioners in their methods of using and vulcanizing hard rubber.

Chapter XVI., on celluloid and zylonite, by Dr. Evans, ought to revive the interest in these materials, as for some cases nothing has ever successfully replaced them.

Chapter XVII., on temperament, by Prof. A. H. Thompson, of the Kansas City Dental College, is a valuable contribution to the subject in the interest of dental prosthesis. The tables are elaborate, and carefully prepared. They will be referred to often by those who have risen above the mechanics of dental practice and are looking into the broader fields.

Chapters XVIII. and XIX., by H. H. Burchard, M. D., D. D. S., on crown and bridge work, is most excellent; and his selections from out of the great mass of methods is certainly of very great advantage to the beginner.

Chapter XX., on the hygiene of dentures, is a new contribution, and one much needed. As in all of the author's work, the subject is well presented.

Chapter XXI., by Dr. Ottolengui, editor of the *Items*, on the subject as he entitles it, "palatal mechanism," is very good, and reminds us of the valuable work done by Dr. Kingsley. Presented as it is by the author in his well-known literary style, it gives it a double value.

In conclusion, we desire to say that but little fault can be found with the book. Perhaps one or two chapters could have been left out or condensed, and a chapter added on the art anatomy of the human face in its relation to and application of methods in constructing artificial dentures. It would have made the character of the volume more in harmony with the title—"Prosthetic Dentistry." This will be undoubtedly supplied in some of the future revisions of the work.

The publishers are to be complimented on its general appearance. But few typographical errors are present; the type is excellent; the illustrations beyond comparison. In cases where the engraver's art was not sufficient the half tone process has been used, which is a decided improvement. Pictures are a prominent feature, numbering 983 in 730 pages of text.

It will surely be accepted by the teachers and profession of the world as a very much needed addition to the literature of dentistry.—A. O. HUNT, D. D. S., Professor of Dental Prosthesis and Art in the Chicago College of Dental Surgery.

PAMPHLETS RECEIVED.

GOLDEN ANNIVERSARY of the Pennsylvania Association of Dental Surgeons, December 16, 1845 to December 16, 1895.

TRANSACTIONS OF THE ILLINOIS STATE DENTAL SOCIETY FOR 1896. Louis Ottofy, secretary. Published by H. D. Justi & Son, Philadelphia and Chicago. Cloth, pages 182.

THE NATIONAL ASSOCIATION OF DENTAL FACULTIES. A proposed midwinter meeting. Our educational system. Editorials from the October, 1896 number of "*The Dental Practitioner and Advertiser*."

PRACTICAL NOTES.

GINGIVITIS AND ITS RELATION TO CROWN WORK.

By H. J. GOSLEE, D. D. S., CHICAGO, ILL.

It is certainly a lamentable fact to note the surprisingly small percentage of roots carrying crowns that are entirely devoid of any evidence of periosteal inflammation, or that are surrounded by tissue presenting a normal or healthy appearance, as compared with the very great percentage that invariably manifest more or less marked degrees of gingivitis.

On the face of the great amount of literature that has been given us upon this subject, and in view of the rapid strides of progress and advancement achieved in this line, it seems indeed a deplorable condition when one can conscientiously and candidly assert that only from 15 to 25 per cent would be a fair estimate of those roots, which after carrying crowns for a time, present no indications of this condition, and yet we are convinced by close observation that, on the average, such is the case.

The question naturally arises then as to its probable cause.

Since a very great percentage of the crowns now in use are made of gold, or having gold bands, would it be just to attribute it to the assertion sometimes made that the tissues of the mouth take unkindly to that metal? when we will perhaps turn right around and advocate a gold plate to the next patients presenting themselves; and when we know as an absolute certainty, vouchsafed to by proof and experience, that there is no substance, either metallic or mineral, that when brought into contact with the tissues of the mouth presents so many favorable points as gold. Yet for all of that, in crown work we can but acknowledge the frequent presence of an unfavorable condition, but does it not seem very plausible that the fault lies not in the metal, but in its unnatural relation to the root and tissue by virtue of poor adaptation.

It is an acknowledged fact that the tissues take very kindly to porcelain and that a much greater proportion of crowns made of that material are worn with comfort and without the presence of inflammation and subsequent recession, than are those made of gold; but it looks probable and in fact seems evident to me that that difference is due in main to the fact that a porcelain

crown when adapted and in position presents always this favorable condition, a perfectly smooth vitrified highly polished surface, with a rounding edge. And as this is the most desirable and natural condition, why then would not the tissues take kindly to it and remain normal and healthy? when, unless there is irritation from an improperly prepared root, a poor fitting band, or impingment upon the membranes caused by driving the band on too far, there is absolutely nothing to prevent.

We are impelled to maintain without hesitancy that this can be accomplished and the same results secured in the use of a gold crown, if we will but take the time, pains and precautions to properly prepare our roots in the first place, that the band may be fitted accurately and closely without having to drive them on with mallet or sledge hammer; that they may leave no semblance to a shoulder, and then round and polish the edge nicely and give to the metal a high and smoothly polished surface.

It certainly seems consistent and reasonable then to concede the fault either to the preparation of the root or the adaptation and finishing of the band, for whether it be metal or porcelain, unless the proper precautions are observed to avoid all irritating influences, the ultimate result must be inflammation, and in its *remedy* there is but one definite conclusion, the same as is applied to inflammation of any part and is synonymous with its treatment—remove the cause.

In the fittings of bands many seem inclined to think that they should fit the root so closely as to necessitate their having to be driven into place, and that they should extend as high root-wise as is possible; while almost the reverse is suggestive of the best results, for if the root is properly prepared by a sufficient removal of the enamel to parallel the surfaces, that the diameter may be no greater at any point than under the free margin of the gum, the band fitted close and snug, being only permitted to pass high enough up on the root to secure a purchase upon same and pass just beneath the gum line, and after mounting, the thorough removal of all particles of surplus cement, then burnishing the edge up closely to the sides of the root with a smooth foot plugger or burnisher in hand or automatic mallet, no conditions will be present that will by producing irritation, cause or promote the occurrence of inflammation or gingivitis.

CARBOLATE OF IODINE. (?)

By E. G. BETTY, D. D. S., CINCINNATI, OHIO.

I have frequently been asked what sort of a disinfectant I use in the treatment of fœtid pulpless teeth, alveolar abscess and that interminable list ycleped pyorrhœa alveolaris *et sequentes*.

The caption answers the question.

Its preparation is at once simple and ready and should be done just before using. To about two or three ounces of distilled or filtered water, which has also been boiled, but reduced to 100° F., add first ten or twelve minims of Calvert's cryst. carbolic acid No. 1, then the same quantity of officinal tinct. iodine. Stir this up by filling the syringe bulb and injecting back into the glass. The muddy color of the iodine will disappear, with an apparent evolution of gas. A peculiar odor is at once perceived, entirely different from that of either of the principals. When gingival inflammation is present, use as hot as the patient can stand.

I have found this far superior to listerine, boracic acid and all that class.

What the chemistry is, I have not stopped to elaborate. It may be mentioned, however, that iodine will appropriate hydrogen where and whenever it can, thus liberating nascent oxygen, the only second to active combustion as a radical executioner of micro-organic life.

That is also the chemistry of the germicidal powers of the bi-chloride.

The latter cannot be used so freely as the solution under consideration.

I have for fifteen years been a firm advocate of the use of iodine as a disinfectant and for the reason stated, but have never said so in print, repeated questioning being my reason now, and that through the courtesy of the REVIEW.

MEMORANDA.

Dr. J. B. Hamilton has resigned from the marine hospital service.

The *Medical Standard* has a new editor in place of Dr. J. G. Kiernan, who so long and ably filled that position.

For soreness of the sides of the tongue and the pharynx use about 5 per cent loletin in water—warm water. Try it two or three times daily.

Dr. C. H. Adams, of Frankfort-on-the-Main, made a short visit to Chicago in October. Dr. Adams is the new president of the American Dental Society of Europe.

The Odontoblast is a new journal edited by the students of the dental department of the Detroit College of Medicine. No. 1, vol. i., is just out. We wish it success.

Some cases of fungous growth of the gums will improve rapidly if you use sulphate of copper in powder or the solid crystals. Antidote with carbonate of magnesia.

A clergyman in Ottumwa, Iowa, swallowed a rubber plate in September and died in thirty minutes. The newspaper account did not state how many teeth were on the plate.

Dr. Alfred Burne has been appointed a magistrate for the Belmore district in Sydney, N. S. Wales. Dr. Burne is one of our most active correspondents in that far-off country.

What do you think about it when your journal has the advertisements in front of the reading matter? Which are more interesting, the papers or the ads? An early answer will oblige.

The Chicago Dental Society will hold a clinic February 1st and 2d, 1897. Several papers will be read in the afternoons of Monday and Tuesday. A dinner will be given Tuesday evening.

Using boroglycerin in hot water—10 per cent—adds to its effectiveness when you are about to begin the removal of deposits from the roots of teeth. The patient will notice the change. Condyl's fluid should be used about 110° F.

"I am not writing for publication at all, but you try powdered salol for root filling. The crystals are too large, as you buy it. Grind it in a mortar to a fine powder, place a lot in the cavity, use as large instruments at first as will enter the canals, then smaller ones to carry it further in. Don't melt it. Needless to say, the canals must be dry." C.

Dr. J. Leon Williams, of London, England, will read the following paper at the January, 1897, meeting of the New York Odontological Society: "Caries of Dental Enamel." The paper will be divided into two parts, consisting of, first, a comparative examination of the minute structure of enamel of the teeth of some of the higher animals and man, with special reference to the predisposing causes of caries. Second, the phenomena of decay of the enamel. The paper will be illustrated by the exhibition of seventy or more photographic lantern slides.

SECTIONS OF THE AMERICAN DENTAL ASSOCIATION.—ORGANIZATION OF SECTIONS.

SECTION I. Prosthetic Dentistry, Metallurgy, and Chemistry—A. O. Hunt, chairman; A. Boice, secretary; Grant Molyneaux, George H. Wilson, W. Storer How, A. J. Brown, Louis C. LeRoy, C. H. Harroun, N. D. Edmonds, W. T. McLean, S. E. Gilbert, L. C. Taylor, E. S. Gaylord, W. H. Fundenberg, George M. Whitfield, V. H. Jackson, E. S. Holmes, A. N. Roussel, H. G. Ulrich, Howard S. Seip, W. H. Baird, S. W. Foster, Charles A. Meeker, J. M. Ayer, George E.

Adams, Oscar Adelberg, S. B. Brown, Boyd H. Baker, George C. Brown, G. V. Black, C. S. Case, Henry S. Colding, C. C. Carroll, George Evans, H. H. Jackson, J. Rollo Knapp, H. H. Keith, H. T. Sutphen, V. S. Jones, B. F. Luckey, Henry McManus.

SECTION II. Dental Education, Literature, and Nomenclature.—Louis Ottofy, chairman; S. H. Guilford, secretary; C. N. Pierce, H. W. Morgan, J. Taft, Thomas E. Weeks, M. F. Finley, J. Hall Moore, Charles P. Pruyn, Henry Barnes, S. E. Gilbert, S. Freeman, L. C. Taylor, L. Ashley Faught, J. L. Williams, Eugene H. Smith, T. M. Allen, A. H. Thompson, A. N. Roussel, William Conrad, C. R. Butler, S. W. Foster, C. L. Goddard, C. J. Essig, E. M. Kettig, S. B. Brown, J. Adams Bishop, E. A. Bogue, L. L. Barber, H. H. Boswell, G. V. Black, C. D. Cook, L. L. Dunbar, C. E. Esterly, George L. Field, J. N. Farrar, George J. Friedrichs, Joseph Head, C. W. F. Holbrook, D. M. Hitch, C. S. Hardy, Frank Holland, Robert Huey, C. R. Jefferis, E. C. Kirk, W. H. Morgan, B. G. Maercklein, Theo. Menges, F. J. Maynard, A. E. Mascort, James McManus, H. J. McKellops, Daniel N. McQuillen, H. B. McFadden, H. B. Noble, A. L. Northrop, Edmund Noyes, J. B. Newby, George S. Nason, Francis Peabody, F. A. Remington, C. B. Rohland, W. E. Richardson, F. Edsall Riley, W. P. Richards, W. H. Richards, R. A. Rush, L. D. Shepard, C. S. Stockton, E. D. Swain, B. Q. Stevens, M. B. Straight, B. Holly Smith, C. W. Stainton, A. P. Southwick, H. T. Smith, J. F. Stephan, D. D. Smith, Thomas C. Stellwagen, Charles K. Van Vleck, I. N. Van De Water, W. W. Walker, J. L. Wolf, George W. Warren, W. Woolsey, George M. Whitfield, W. A. White, H. Newton Young, E. M. Zell.

SECTION III. Operative Dentistry.—S. C. G. Watkins, chairman; H. L. Ambler, secretary; J. Taft, G. W. Hoysradt, J. N. Crouse, W. N. Morrison, Louis C. LeRoy, A. H. Fuller, T. S. Waters, A. J. Brown, R. N. Kesterson, J. Hall Moore, A. O. Ross, M. B. Culver, A. N. Priest, Corydon Palmer, W. W. Shryock, Henry Barnes, S. B. Palmer, S. E. Gilbert, L. C. Taylor, S. G. Perry, Harvey Iredell, W. E. Page, W. H. Fundenberg, W. F. Fundenberg, C. N. Johnson, S. A. Freeman, B. Q. Stevens, H. F. Harvey, John I. Hart, W. St. George Elliott, P. J. Wilson, A. N. Roussel, Earl P. Hawes, Louis Jack, O. S. Watrous, H. G. Ulrich, P. S. Bollinger, G. W. Cochran, William Conrad, C. R. Butler, A. R. Starr, J. S. Hurlbut, F. C. Kemple, Edward M. Kettig, J. Adams Bishop, E. A. Bogue, L. L. Barber, H. H. Boswell, H. J. Burkhart, F. C. Barlow, E. Parmly Brown, E. M. Beesley, W. G. Browne, C. S. Butler, M. L. Chaim, C. D. Cook, Dwight M. Clapp, W. R. Clifton, C. C. Chittenden, George F. Cheney, W. G. Chase, William Crenshaw, L. M. Cowardin, J. H. Coyle, J. L. Crater, N. M. Chitterling, William H. Cogan, Isaac N. Carr, J. W. Canaday, I. B. Davenport, E. T. Darby, Charles E. Dunn, L. L. Dunbar, T. S. Hacker, T. T. Hayward, H. F. Harvey, Joseph Head, Frank Holland, Robert Huey, Meta T. Haley, W. E. Harper, C. W. Hoblitzell, C. S. Inglis, C. R. Jefferis, Victor S. Jones, W. T. Jackman, G. E. Johnson, H. R. Jewett, Daniel A. Jones, S. E. Knowles, D. E. Kelley, J. Rollo Knapp, B. F. Luckey, H. C. Miller, F. T. Murlless, Henry McManus, Daniel N. McQuillen, H. B. McFadden, P. A. MacLean, M. B. Straight, A. H. Sibley, Marvin E. Smith, E. A. Stebbins, R. M. Sanger, Charles Sill, B. Holly Smith, D. D. Smith.

H. T. Sutphen, Nelson T. Shields, G. Marshall Smith, Z. Viola Swift, F. A. Shotwell, H. H. Sisson, A. W. Sweeny, W. C. Speakman, James McManus.

SECTION IV. Histology and Microscopy.—Frank Abbott, chairman; I. P. Wilson, secretary; L. L. Davis, F. C. Kemple, Thomas P. Hinman, Frederick Hindsley, J. E. Hinkins, Henry A. Hull, E. Slegel.

SECTION V. Materia Medica and Therapeutics.—J. S. Cassidy, chairman; L. P. Bethel, secretary; A. W. Harlan, Leo Greenbaum, A. H. Peck, J. W. Wassall, N. S. Hoff, L. C. LeRoy, James Truman, Wilbur F. Litch, M. W. Foster, A. R. Starr, S. W. Foster, B. Douglass, S. B. Dewey, Jessie B. Dillon, L. L. Dunbar, A. W. Davis, A. H. Gilson, S. L. Goldsmith, J. P. Gray, O. J. Gross, E. C. Kirk, J. F. Lummis, H. T. Sutphen.

SECTION VI. Physiology and Etiology.—J. D. Patterson, chairman; L. E. Custer, secretary; W. C. Barrett; M. L. Rhein, Thomas Fillebrown, H. A. Smith, Emma Eames Chase, L. Ashley Faught, H. T. Harvey, G. V. Black, Arthur B. Freeman, E. A. Floyd, John E. Frazier, F. H. Gardiner, J. Howard Gaskill.

SECTION VII. Anatomy, Pathology, and Surgery.—W. C. Barrett, chairman; Thomas Fillebrown, secretary; L. P. Bethel, M. L. Rhein, W. P. Horton, J. W. Wassall, J. Y. Crawford, T. W. Brophy, W. T. McLean, R. J. Hart, S. Freeman, M. H. Cryer, H. T. Harvey, Norman J. Roberts, G. V. Black, G. L. Curtis, T. L. Gilmer, W. E. Griswold, N. J. Goodwin, Frank G. Gregory, John S. Marshall, C. A. Brackett.

A NEW DENTAL BUILDING IN TORONTO.

Dr. J. B. Willmott, whose name was received with applause, read the following paper :

The opening of this substantial building with its magnificent equipment, owned by the dental profession of Ontario, would seem to be a fitting time to look backward and briefly trace the development of dentistry in this Province.

In the beginning, dentistry as a profession in the Province of Ontario was "without form and void." That beginning does not date back more than fifty years, 1846. At that time there were probably six persons in the Province engaged in the practice of dentistry, all either from England or the United States. These increased, partly by immigration, and more largely by a brief apprenticeship of from three to twelve months in the office of a practitioner, so that by 1866, when organization first began to be discussed, the numbers were estimated at 175. In January, 1867, Dr. B. W. Day, of Kingston, invited a number of dentists to meet in Toronto for the purpose of organizing a dental association for the Province. The result was so encouraging that another meeting was held in Cobourg in July of the same year, which was more largely attended, and the organization completed. At the third meeting, held in Toronto January, 1868, 80 per cent of the legitimate dentists of the Province were present. The credit for this successful attempt to organize the profession is largely due to Messrs. B. W. Day, J. S. Scott, F. G. Callender, John O'Donnell, G. V. N. Relyea, C. S. Chittenden and H. T. Wood. Of these Dr. H. T. Wood, Toronto, is still an honored and active member of the Ontario Dental Society, while our venerable friend, Dr. Relyea, is an active member of the Sixth District Dental Society of New York State. The others are gone over to the great majority, or are engaged in other occupations.

As the result of misunderstanding and personal grievances, a number of members of the Ontario Dental Association withdrew, and in October, 1868, organized the Ontario Society of Dentists for the specific purpose of discussing professional subjects. In 1869 the two societies united under the title of the Union Dental Association of Ontario, enrolling a large percentage of those legally engaged in practice. With the exception of three years the society has held annual meetings, at which a fair percentage of the licentiates have attended, with profit to themselves and advantage to the profession. From time to time local societies have been organized, so that these now exist in all the principal cities, as well as a vigorous Eastern Dental Society, embracing the section of country lying east and north of the city of Kingston. It is to be regretted that the membership in the societies has not increased in ratio with the increase in the number of practitioners. Possibly the younger members have been crammed so full of information at college that they have no capacity for further instruction. One of the immediate results of the organization of the Dental Association in 1867 was an agitation for statutory incorporation. This movement was materially assisted by the members of the Medical Council and the heads of the medical schools in Toronto. After much consideration a draft statute was approved by the association in January, 1868, and a petition for its enactment presented to the Legislature of Ontario then in session. The time was opportune; the legislature was favorable; public opinion approved; the only difficulty lay in adjusting legislation to the personal views and interests of each of the two hundred dentists of the Province. This difficulty seriously endangered the bill. Many dentists had friends in Parliament, and several of these were ready with amendments to cover the private interests of constituents. Conferences were held, compromises suggested, finally an agreement reached, and on the last day of the session the bill was read a third time and passed. On the 4th of March, 1868, amid the usual beating of drums and salvos of artillery, the Lieut. Governor, Sir William Howland, presented the new born corporate infant to the public, bestowing upon it the high sounding but "truly loil" cognomen of the Royal College of Dental Surgeons of Ontario.

The "Act respecting Dentistry," as passed in 1868, was undoubtedly crude in many points, and incomplete and inefficient in others, but, when disposed to criticise, it is well to remember that it antedates every other dental statute in the world, except an obsolete one of five very innocent clauses, adopted by the State of Alabama in 1841. The framers of our law had absolutely no precedent, nor was anything to be learned from the experience of others, as they were experimenting in an entirely new field. The test of twenty-eight years has vindicated the wisdom of its framers and leads the men of to-day to suspect that they "builded better than they knew." As difficulties in administration were developed the legislature has cheerfully made such amendments as seemed necessary, so that now, with the single exception of a weakness in the "penal clause," it may be considered as complete. Having made considerable inquiry concerning dental legislation, I have no hesitation in saying that Ontario has to-day a more efficient dental law than is to be found elsewhere. Permit me to summarize: The whole dental profession is incorporated as the Royal College of Dental Surgeons; of this college every legal practitioner is a member. Its affairs are managed by a board of directors, made up of one representative from the teaching faculty, and seven

representatives elected biennially in as many territorial districts by the members resident therein, the election being by closed ballot, sent by mail, so that every one may participate. The duties of these directors are to fix an entrance or matriculation standard for students, prepare a curriculum of studies, appoint the members of the teaching faculty and supervise the school of dentistry, appoint a board of examiners and, on their report, pass candidates for graduation and issue license to practice in the province of Ontario, and generally to administer the affairs of the corporation. That these powers have been conservatively exercised and no attempt made to form a close corporation, is evident by the fact that during the year ending September 1, 1895, ninety-seven students, and in the year ending September 1, 1896, 188 students have been matriculated, a number unfortunately very much greater than our increase in population and wealth would justify.

The gentlemen who from time to time have been elected directors, and have given time and thought to the affairs of the college are entitled to, and I trust, receive, the thanks of every member of the profession. But one of these, our honored friend, Dr. H. T. Wood, has been a member of every board since 1868. The present directorate have initiated a practice which they hope may be continued by their successors. That each succeeding class of students may become familiar with the features of the men who have so wisely guided the affairs of the college, they have had made by the well-known artist, J. W. L. Forster, Esq., life-size crayon portraits of the past presidents and the present president, and the dean of the faculty, and these now adorn the walls of the board room. Since the profession was incorporated in 1868, 726 certificates of license have been granted by the directors; of these 21 are not in the province, 77 have died, 83 have removed or ceased practice, and 545 are now resident practitioners.

Since very early in our corporate history, 1872, an entrance examination has been required of dental students. In 1878 the certificate of the education department was substituted and since that time no entrance examination has been held by the college. The standard has been raised from time to time until now it is matriculation in the faculty of arts of a Canadian or other recognized university, or on equivalent certificate issued by the education department of Ontario. In this matter we may fairly claim to lead the dental colleges of the world.

Closely associated with the incorporation of the profession was the question of a school of dentistry. At the first meeting of the directors this matter was the subject of discussion. In August, 1868, appeared the announcement of the "Canada College of Dentistry," Toronto, a private undertaking, but so far as I can learn, it never materialized. In October, 1869, the teaching department of the Royal College of Dental Surgeons was organized, and commenced operations. At the close of the first session the directors were financially embarrassed, and the staff was disbanded and the school closed. At the meeting of the Ontario dental society, held in Hamilton, July 1875, the following resolution was unanimously adopted:

"In view of the admitted want of a dental school in this province, this society earnestly recommend to the board of directors of the Royal College of Dental Surgeons of Ontario, as soon as possible, to avail themselves of the powers given them by the amended dental act, and take the necessary steps to establish a school of dentistry in Toronto, and to aid it by such appropriation of funds as in their judgment may be expedient."

On receipt of this resolution the directors of the Royal College of Dental Surgeons, after some hesitation, decided to take the necessary steps to establish a school, and requested Dr. J. B. Willmott and Dr. Luke Teskey to undertake the task, the conditions being that the directors should assume no financial liability beyond any grant which might be voted in aid of the school. These gentlemen gave the matter long and serious consideration, and finally accepted the commission on the terms prescribed by the directors, conditioned on their granting \$250.00 for furnishing, \$150.00 per annum for rent, and that no less than eight students would promise to attend the first session.

These conditions were complied with and the school of dentistry opened on November 3, 1873, with eleven students. At the regular annual meeting of the directors in March, 1876, this agreement was formulated into a by-law under the provisions of which the school was conducted, Dr. W. T. Stuart and Dr. W. E. Willmott being subsequently added to the faculty and demonstrators appointed as necessity required. By 1893 the attendance had so increased that it was thought wise to amend the by-law so as to provide that the school should be conducted by the directors, they receiving all lecture and other fees and paying the teaching staff and all other expenses. The school was reorganized, the staff enlarged, and for the fourth time new premises obtained and fitted up. At the meeting of the directors in April, 1895, it was apparent that the only way to provide suitable accommodation for the growing classes would be to erect a building.

With \$16,000.00 cash in hand it was thought that the enterprise could be easily financed. A lot was purchased, Mr. D. B. Dick selected as architect, a building committee appointed and the matter so vigorously pushed that by August 1, 1895, contracts were let and the work commenced.

This beautiful and substantial building, with its complete equipment, has cost including the ground, \$46,000.00. By the first of November next the liability of the directors will not exceed \$11,000.00. This entire property belongs to the dentists of Ontario, each one of whom has an equal share both in ownership and management, a condition of things unique in the history of dentistry, and one on which the dentists of Ontario may well be congratulated.

In the early efforts at dental education a difficulty was encountered in the fact that while all the American dental colleges conferred the degree of Doctor of Dental Surgery, the Royal College of Dental Surgeons had no such power.

In 1872 the directors sought from the Legislature several amendments to the dental Act, and among them authority to confer a degree. The Hon. Adams Crooks, then Minister of Education, informed them that the policy of the government was to confine any further degree granting power to the University of Toronto, and that at the ensuing session the university act would be so amended that it would have power to grant a degree in dentistry as well as in other branches of science. This promise was kept, and to benefit by its provisions, prompt application was made to Toronto University for affiliation and a curriculum in dentistry. This was backed up with such respectable precedents as the Royal College of Surgeons, England, Harvard University, Mass., the University of Michigan and others. The petition was presented by Dr. Wm. Oldright, our staunch friend in the senate, but though no official intimation was ever given that the application was declined, we were never advised that it was granted. In turn application, formal or informal, was made to each Ontario university with one

exception and these were officially or unofficially refused or declined. Dentistry had not yet assumed sufficient importance to be recognized.

When Mr. Wm. Mulock, now the Hon. Wm. Mulock, LL. D., Postmaster-General of Canada, was elected Vice-Chancellor of Toronto University, his policy was to widen its sphere and influence and to encourage suitable affiliations. His attention being called to the needs of the dental profession, he suggested that another application for affiliation should be made. This being done, it was received by the senate in the most cordial manner, a statute affiliating the Royal College of Dental Surgeons, being passed in May, 1888.

The curriculum was approved in November of the same year and the first examination held in March, 1889. It is a somewhat interesting coincidence, that on the day dentistry in Ontario, as a corporate body, attained its majority, March 4, 1889, twenty-five dentists and dental students paid in their fees and filed their applications for admission to the first examination ever held by a British university for a doctor's degree in dental surgery.

The high standard which characterizes the curricula of the several departments of Toronto University is equally maintained in that of dentistry. With the degree of D. D. S., like that of M. D., confers no legal rights, so far as practice is concerned, it is an honor to which every dental student in Ontario aspires. While in 1868 but one gentleman in Ontario, Dr. H. H. Nelles, of London, possessed a dental degree, in 1896 over 270 members of the Royal College of Dental Surgeons are doctors of dental surgery.

In an hour or so His Honor the Lieut-Governor will declare this building opened. For what purpose? Not to educate men to practice a specialty of medicine, but to educate dentists. Dentistry cannot properly be considered a specialty of medicine. It is true that it is a branch of the healing art, but it has not grown out of medicine; it forms no part of the curriculum of medical schools; it has received no aid from medicine as a profession, though individual physicians have rendered it great service.

In its genesis and history no closer relationship can be traced than as an adjunct of medicine it covers an important field in the great healing art for which medicine has not in the past, does not now, and is not likely in the future, to make any provision. Dentistry has grown up outside of medicine. It has organized its own colleges. It has its own text-books, its own literature, its own periodicals, its own societies and its own appliances.

Though compared to general medicine, it occupies a very narrow field, it has still a score of unsolved problems, in which all civilized members of the human family are deeply interested, to the solution of which the brightest and ablest of men might well devote their thought and energy. Dentistry in Ontario has made great progress in the past thirty years. With added advantages it may make greater in the next. Buildings and material equipment do not make efficient educational institutions; that depends on the teachers, but these are of great assistance.

The aim of the Royal College of Dental Surgeons is, through its teaching faculty, to so educate the mind, judgment, eye, hand, and heart that its students may become skillful, successful, honorable dentists, proud of their profession and a blessing to their fellowmen.

To this end this building is this day dedicated.

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ORIGINAL COMMUNICATIONS.

PROSTHETIC DENTISTRY OF TO-DAY.*

BY E. H. ALLEN, D. D. S., FREEPORT, ILL.

We are gathered here to-day in convention, representing the dental profession of northern Illinois. Our program is well arranged, and I think very complete with one notable exception. If it had not been for myself I am inclined to think that prosthetic dentistry would not have a place on the program, and I have noticed this to be the case in meetings of other dental societies. Operative dentistry in all its phases is well and ably written and discussed; and so realizing the importance of prosthetic dentistry I wish to present the subject to you briefly and consider the standing of this important branch of dentistry.

I have had some correspondence with some of my friends in the profession, and have put to them a few questions bearing upon the subject, in order to find out what they considered the standard of prosthetic dentistry compared with operative dentistry.

From these letters I learn these facts: That prosthetic dentistry is not up to the standard of operative dentistry. Many reasons may be given for this. Operative dentistry seems to present a more attractive field to the profession, particularly to the recent graduate; it presents perhaps a greater variety of operations, and certainly more definite results. It seems to be more high toned, and many seem to think a higher order of talent is required in operative dentistry than in prosthetic. This I do not admit, and will refer to this later on.

*Read before the Northern Illinois Dental Society, Elgin.

It will be admitted by all that vulcanite has been the one cause, more than anything else, that has depreciated the standard of prosthetic dentistry. The ease with which a vulcanite plate can be constructed, and the cheapness of the production has undoubtedly presented an attractive field for incompetent persons to enter in times past, who have come into competition with the more skillful and painstaking dentist, so that he is inclined to turn to operative work and let the prosthetic work go, and the public seem to demand the cheapest possible denture.

I might say right here that I have known ladies who have come to my office to talk teeth, who were clad in silks and seal-skins, having diamonds to the amount of as much as five hundred dollars, how much more I don't know, who were wearing a poorly fitting rubber plate. Teeth were selected with apparently no thought of artistic selection and adaptability. Cases like these certainly must make a dentist whose ideals are high, turn to operative dentistry, with a feeling of satisfaction that in this branch he can find a more appreciative field for operation. Again the introduction of vulcanite rubber as a base for artificial dentures has cheapened alike fee and ability required.

It does not take a very long time for a person of moderate ability and imitative skill to construct a rubber plate that will fill the requirements of mastication fairly well; and the dental institutes, parlors, and I might add dental colleges, have pushed the cheap vulcanite on the public until hardly anything but vulcanite is demanded, and still less known of; and without doubt many teeth have been sacrificed on account of this cheapness that otherwise could and would have been saved. There is no doubt, then, that vulcanite rubber plates have been the main reason for the inferior position that prosthetic dentistry holds to-day. One of my correspondents says: "It has been a boon to poor people because of its cheapness, but it has lowered the standard of dental prosthesis." But the point I wish to make is this: That in consideration of the fact that the necessity for an artificial denture will probably exist to the end of my life as a practitioner of dentistry, that after all that can be done in the way of filling, crown and bridge work, the artificial denture waits at the end of the efforts of the operative dentist in the majority of cases, why not, then, be able to turn to the prosthetic branch, and supply the patient with a substitute that does not make the patient look "strange?"

Another writes: "Few dentists possess the artistic ability to become experts in prosthetic dentistry." Surely then dental prosthesis should occupy as high a plane as the operative. Continuing, he writes: "Most dentists look at the manufacture of a set of teeth as purely mechanical; while to my mind it requires a finer eye, a finer artistic sense and as much mechanical ability to properly select and adapt a set of teeth to some of the patients who call for our services than to make a good filling." This expresses my idea perfectly, and refutes the idea that the operative dentistry requires more ability, as was referred to before.

Now then let us lift dental prosthesis out of the mire into which it seems to have fallen. Let us study more diligently the requirements of each case we have, and study to produce more artistic results. Even with the limitations of the vulcanite plate, very excellent results can be produced by care in the selection of teeth and the arrangement of the same. What looks worse than a small white tooth set ever so even, and worn on the upper jaw of a patient with dark complexion, and a large jaw and wide face, and dark yellow natural teeth in the lower jaw?

No wonder that dental prosthesis falls into disrepute, when the dentist who would ordinarily insert a good filling, sends out such a denture as this; so as the dental profession has and will have for some time to come the necessity and demand for artificial dentures, we should meet the situation and put our thought, energy and skill into this work of dental prosthesis, and I am sure if the results are pleasing, the case will give as much gratification as any other dental operation. Again I hold that every dentist, particularly those outside the larger cities, should not put aside the plate work that comes to him in his practice, as it will broaden and deepen his foundation principles, and if he can succeed in dental prosthesis he certainly will succeed in the operative, and the production of a fine, artistic, good fitting denture does more than anything else to inspire the confidence of the patient in their dentist than almost anything else in the way of a dental operation. A correct definition of dental prosthesis would include crown and bridge work, but the intent of this paper is to more particularly treat of plate work. I will say nothing on that subject except to sound a warning that if the character of a great deal of the crown and bridge work, being done at the present day, is not changed for

the better, it will not come up to the standard of excellence it occupies to-day. I must say a word about metal bases for dentures.

Gold, continuous gum where the patient can afford the higher priced, such as gold or continuous gum, it is the duty of the dentist to see that his patient is educated to think they must have it, and I am sure that no one who has worn a clean, nice gold or continuous gum denture would ever be satisfied with vulcanite again.

I am writing too long. I fear I have not successfully presented this subject to you. The thoughts that come crowding in remind me that much may be said on this subject, but if I have called attention to dental prosthesis in a way that will tend to elevate it to the standard of any other branch of dental science, I shall be glad even if it be only a beginning.

THE ILLINOIS DENTAL LAW.*

By W. J. PHILLIPS, D. D. S., ELGIN, ILL.

Some time since I had occasion to look up the statute governing the practice of dental surgery in this State, and was amazed at the inadequacy of the law to protect the public from incompetent and dishonest persons.

Not only is the public imposed upon by such charlatans, but our profession is brought into disrepute and the less discerning portion of the public learns to distrust dentists in general.

The statute as it now stands provides that at the present time any one must procure a license of the State Board of Dental Examiners before commencing the practice of dentistry.

However, a person holding a license may be the nominal proprietor of a dental office and hire on a salary or percentage, or take in partnership, any one whomsoever he will, who need not be legally or in any other way qualified to practice, and yet by his association with the licensee he receives the protection of the law in conducting an unprofessional and many times a dishonest business.

Now this condition of things is of course well known to you all, and probably every one of you have thought more or less on the subject and will agree with me that some remedial legislation should be had which will change for the better the present state of affairs.

*Read before the Northern Illinois Dental Society, Elgin.

I am well aware that there are many men in the practice of dentistry holding licenses from the State whose professional ideas are very degraded and from whom nothing that would tend to elevate and ennoble our calling could be expected or had. These cases are of course hopeless as you cannot legislate honor into them. But added to this number are two to four times as many who are engaged in aiding these sharks to fleece those whom their extravagant advertisements draw to them.

It seems to me that this class might be held in check somewhat by proper legislation. As to just what should be added to the present dental law in your individual opinions might and probably would differ.

A suggestion would be to add a section to the statute as follows :

"No person acting as an assistant or co-partner shall perform operative dentistry, including the taking impressions of the mouth, unless such person holds an individual license from the State board of dental examiners."

We know that legislation in this direction has been attempted and thwarted by the class of unscrupulous persons alluded to, but it seems to me that the object sought is of so much moment that another attempt might well be made, and perhaps with united action success might be attained.

Now this paper has been made purposely short and has touched on only a few points of the subject, with the hope of bringing out discussion which would lead to action in the matter, to the end that the public might be more faithfully served and the profession elevated.

IODOFORM IN DENTAL PRACTICE.*

By LOUIS OTTOFY, D. D. S., CHICAGO, ILL.

Iodine is an important element. In its various combinations with other elements, such as potassium, mercury, etc., it is one of the most important of the medicaments in common use. It is not necessary to mention before this society its many well recognized properties. In its most active form, that of the crystal, it unfortunately possesses many undesirable qualities. Chemists have, therefore, been active to present it in a form, which while possess-

*Read before the Northern Illinois Dental Society.

ing the virtues is devoid of the vices. The best substitute so far produced is the much maligned drug so well known to us—iodoform.

I have been much interested in the study of a contribution to literature by Dr. Med. A. Schirmer, the German editor of the *Schweizerische Vierteljahrsschrift für Zahnheilkunde*,* reviewing the history of the so-called “iodoform war,” and have taken the liberty to quote extensively from the article referred to.

This drug depends for its virtues on iodine, which is simply in a form suitable for handling, by having some of its objectionable qualities concealed, and by being presented to us in a form which makes it applicable to tissue and in situations where the crystals could not possibly be employed.

When it was first employed in surgery under the impression that it was an antiseptic, its admission to the surgeon's arena was hailed with delight, and, notwithstanding its objectionable features it soon became extensively employed as a supposed antiseptic in surgical operations, especially where large surfaces upon the body have been destroyed by disease or removed by the surgeon's knife, as also in gynæcology. Eventually its toxic effects were noted, as well as the fact that erythematous eruptions and eczema frequently followed its application, and these two objections, with that of its extremely disagreeable odor, often leading to gastric disturbances, were sufficient to precipitate what became known as the “iodoform war.”

The study of bacteriology then developed the fact that iodoform was absolutely worthless as an antiseptic, that in fact in one marked case the preponderance of evidence led to the conclusion that disease was transmitted by its use. And it was an anomalous discovery which disproved this. It was shown that certain bacteria not only were not destroyed, but that they actually lived and thrived in good iodoform for at least one month. The claim was then set up that iodoform was not an antiseptic in the then ordinarily accepted sense, but that the successful use of it in practice, which was readily admitted, and which could not be explained, justified the surgeon in continuing its use.

All this controversy, however, led to an attempt to replace the drug by one, which was free from objectionable features. The chemist flooded the market, for commercial reasons, while the

*Vol. VII., September 1896, p. 320.

surgeon, in the hope to get something as effective, but free from objections, encouraged this activity.

As a result we have a large number of substitutes, which have been presented to us. The principal object to be attained is, to get the combination of elements, so as to contain a large percentage of iodine. If we remember the fact that iodoform contains an exceedingly large percentage (96.7) of this element, we can somewhat account for its powerful action; and at the present day it seems that the virtues of iodoform, as exhibited by the iodine when set free, are due to this large percentage, and that the attempts to produce a satisfactory substitute, are abortive for the reason that nothing has as yet been produced which would yield the same results if it did not contain as much iodine, and when it did, undesirable effects were also sure to accompany its use. There are probably other reasons as well, which may be merely referred to by the statement that the results are probably due to the different manner in which the iodine is given off.

Among the most important substitutes placed upon the market as a result of the controversy, are the following: Jodol, aristol, loretin, europen, nosophen, soziodol, dermatol, airol, and as an indication that none of these seem to fully fill the requirements and that the attempts to produce something are desperate, I might mention the fact that some German investigators have recently placed upon the market a preparation whose German name is dijodsalicylsäuremethylläther, but wisely they have also given it the chemical name of sanoform. None of these contain the same proportion of iodine as iodoform. The most powerful of them, iodol, contains 88.9, or about 7.6 per cent less than iodoform. Nosophen contains 61.7, while europen with only 27.6 and airol, 24.8, do not seem worthy of rank with iodoform as an iodine conveyer. It would also seem perfectly reasonable that the objections raised against it cannot readily be overcome in preparations of such low percentage.

There is no doubt that much of the controversy regarding the therapeutic values of iodoform is due to an entire want of knowledge regarding its action, and at the present the nature of the process is wholly unknown. The simple fact, however, always stares us boldly in the face that this drug possesses exceedingly valuable properties—virtues which make the surgeon hesitate in

discarding it, and which have led to a return of its use after an unsatisfactory acquaintance with each new substitute was made.

Iodoform is an indifferent body, and it is known that its action is entirely different than that of other antiseptics. Thus it requires to be first decomposed before it can become active, and the most recent investigations seem to prove that this decomposition takes place most readily when processes of reduction of animal matter are in progress. The worse the ulcerated surface the better and prompter the action. In addition to this, the most recent discoveries seem to be convincing, and reveal an important fact hitherto certainly unrecognized, and one which clears up many hazy points, namely, that the decomposition of iodoform and the consequent liberation of iodine, takes place most actively in the presence of living albumen and alkaline fluids. Now then, if in connection with this fact we remember that iodoform is not at all a destroyer of pathogenic microorganisms, we can account in some measure for its peculiar action. In other words, in the presence of the living alkaline circulating medium, the blood, and albumen, its action is most powerful. The diseased surface may be covered with microorganisms, but under the free and active liberation of iodine further reproduction of them ceases; while on the other hand, in the laboratory, in gelatine, agar-agar, and other media and iodoform, the most beautiful crop of pathogenic microorganisms may be cultivated. The value of such experiments, then, is as nil when compared to the application made to a living body. In addition to this I might call attention to the fact that it has been determined that iodine is freely absorbed by living protoplasm.

With this enlightenment, the determination to adhere to the use of this drug, notwithstanding its disadvantages, on part of the surgeon, is readily explained. Aristel has quickly followed iodol into comparative retirement, with dermatol and airol, not far behind; it is true that these preparations have their value, but their use is confined within much narrower limits than was anticipated.

As stated before the action of iodoform is unknown. It is unknown whether the products resulting from the decomposition of iodoform act directly on the bacteria, or make their multiplication harmless; or whether the action is on the tissues, by the penetration of these chemical products into them, and thus destroy the field of operation of the bacterium.

I am fully aware of the fact that much opposition exists among dentists to the use of this drug, but I have been so firmly wedded to it for more than ten years that I cannot discard it; and I have tried every substitute ever offered. While the surgeon has the toxic effect and other disadvantages to contend with, in dental practice there is but one objection, and that is the odor; and that objection is a relative one, and in my opinion and experience, can in a great measure be overcome by the proper and careful, confined and limited use of the drug. I use it in the treatment of exposed pulps, putrescent pulps and root canals, in combination with essential oils, preferably eucalyptol.

In all these conditions I do not depend upon it entirely, but as one of the important agents, especially as the final agent in the process of therapeusis, I depend upon it implicitly. Thus, in root canal filling, the canals are filled with an essential oil and iodoform at the sitting just preceding the final filling, and while I do not aim to make even a part of the root filling of iodoform, I have no hesitancy to allow some to remain in the root, or to force part of it through the apex of the root.

PRESIDENT'S ANNUAL ADDRESS.*

BY DR. H. C. GILL, ROCKFORD, ILL.

Another year has rolled around since we last met as the Northern Illinois Dental Society and it gives me great pleasure to see the familiar faces once more.

I am not a campaign speaker, or much given to oratory, but custom at least makes it my duty, as president of this society, to make a few remarks at the opening of this meeting. My remarks may not be wholly pertaining to the practice of dentistry but what I consider essential to every practicing dentist.

In complying with this custom I propose to say a few words about vacations as a matter of no little importance to every unfortunate who stands six days in the week bent over the operating chair looking down the mouth of one more unfortunate, for the time being, than himself.

To the great mass of our people life is a constant drudgery. Men thought for a long time they could ill afford to be idle, that

*Read before the Northern Illinois Dental Society, Elgin.

the more days they worked the more they would accomplish in life. Time taken for rest was thought to be absolutely wasted. It was thought that satan would find some mischief for idle hands to do, but the sequel shows that rest and recreation have won and satan as usual has retired discomfited and beaten.

There is no respect in which the world has changed more during the present generation of ours, than on this one of a short time of rest during the hot months from the active life of business pursuits. It is only a few years ago that a time of rest during the hot months was thought to belong exclusively to the lazy and indolent.

Only a little while ago it was thought to be highly improper for the president of the United States to take a little time off. Now it is the rule and not the exception of all officers, high or low, to seek rest and recreation. People engaged in mercantile life now take a half holiday each week from their accustomed duties besides a regular annual vacation some time during the summer months. Experience shows us that by this practice nothing is lost and every industrial interest succeeds equally well. Rest, recreation and refreshment are the three r's in a well spent life. No person can labor all the time. Sleep is tired nature's sweet restorer.

Experience has demonstrated that it is not necessarily the one who works most who gets the most done. With proper rest and recreation, men work better while they work and accomplish more. There is something inspiring to the hard overworked man in a well spent vacation. It is like new blood. The mind and body relaxed by the change, strengthened by leisure and the open air, invigorated by increased good health, are the better prepared to again take up the work and business of life and push it with renewed vigor and enthusiasm.

The American people are overworked as a rule. They eat in haste, sleep in haste, and half fed and poorly rested, they rush early to work and quit late and thus the days, weeks, months and years of life go by a perpetual strain. It is all work and worry and by and by, nature weary and exhausted, is worn out long before its time, life becomes a burden. A man can overdraw his bank account. So can man overdraw what nature has placed to his credit. No matter what may be his physical or mental resources, there is a limit. Man who passes the safety point does it at the risk of health or life, or both. The account of nature can-

not be overdrawn any more than the bank account. It must be made good or the result will be the same, physical or mental bankruptcy. A good mind and a sound healthy body go together. They belong together; it is the order of nature.

Our profession is exacting. He who would pursue it with any degree of success, needs a sound mind and a sound body. Anything promotive of these will add to the success and dignity of the dentist's life. Nature loves her worshipers. Those who obey her laws will never go unrewarded. But a man to enjoy rest and recreation must not at all times be an idler. There is no law of nature so necessary to man's comfort, health and happiness, as well as his success in business, as that he shall earn his bread by the sweat of his brow. There can be no health or happiness without it. So man cannot enjoy rest or labor to its fullest extent one without the other.

The question might arise what would be the best thing for a dentist to do to get proper rest and recreation. What might be best for one would be a bore for another. Some here might say get a wheel, and would probably tell you how many century runs they have made the last season. You could readily see how useless that advice would be to any one built upon the plan of your humble servant. My friend Harned would hardly let the opportunity pass to tell you to go home and play with the baby. Very good advice. I have had that. It is a good thing to occasionally get acquainted with your family.

If your fancy should run in the same lines with myself I would suggest for regular every day recreation to get a good horse and see that it has plenty of exercise night and morning. To go through life without the comfort of a good horse would be like a home without a mother.

For periodical recreation what to me is like rain to the parched and dusty soil, like sunshine to the growing crop, is a nice fishing tackle, a good pail of fresh minnows and a man to row the boat with what etc. the fancy may dictate.

CATAPHORESIS.*

By W. V-B. AMES, D. D. S., CHICAGO, ILL.

At this date it will not be considered in order to go into the details of procedure of accomplishing electro-cocaine anæsthesia, and much less into any definitions of terms. All of this has been so extensively and repeatedly given from various sources during the past year, that the effort of this paper will be merely to place before you a few phases of the process for the purpose of discussion.

We are thoroughly satisfied that the carrying of the salts of vegetable alkaloids into the tissue contained within the dentinal tubuli and pulp canals by a certain application of the galvanic current is possible, to an extent, in all cases, and is a safe and commendable procedure. We are satisfied that the rational working out of the underlying principles of this electro-cocaine anæsthesia, and of the principles governing the introduction of various simpler compounds, and of the elements in their nascent state under the conditions furnishing greatest remedial power, will mark one of the most valuable, if not the most valuable epoch of dental practice up to this time.

The bleaching of teeth, the disinfection of roots and the treating of pyorrhœa by electrolytic decomposition have been accomplished facts for more than a decade to my knowledge, but electro-cocaine anæsthesia, although not new has been till some two years since so imperfectly understood, that as a profession we are just waking up to its value, and predictions are rife that the millennium in the way of painless dentistry is near at hand. The impetus given to the production of delicate and accurate apparatus for the governing and application of the galvanic current has been very marked, and now that every dentist who is in the vanguard must have such an apparatus at hand, the uses will multiply, and my prediction is that as the rationale is worked out, the electric current will aid us in accomplishing the major percentage of our successful medications.

The questions of vital interest are : is electro-cocaine anæsthesia a thoroughly safe procedure; and in what percentage of cases is it successful?

The pulp anæsthesia is of itself unattended with risk of per-

*Read before the Northern Illinois Dental Society, Elgin.

manent injury, and danger of constitutional effects is not to be considered. I say, pulp anæsthesia of itself, because the introduction of cocaine into the stomach and general circulation by careless use would not argue against its proper use by so-called cataphoresis. By the time the alkaloid has infiltrated the tissues to the extent necessary for the result, the operator is usually made aware by the absence of pain from the current, the process is discontinued, and there can be no undesirable results.

The result depends on one condition as far as I know, viz., the power of the patient to bear electric motive force exerted on the tissues. Given a favorable patient, and the result is directly proportional to the time of application, and inversely proportional to the resistance of tissue to be overcome. There are local conditions which may militate against successful results, but these must be overcome. For instance, the leakage of current through adjacent gum tissue or through a metallic filling in an adjacent tooth is the most frequent obstacle to success. I have found also cases where the resistance was so increased, apparently, by deposition of lime salts, especially within the substance of the pulp, that very little could be accomplished in the anæsthetization and extirpation of that member. It is with such cases that one feels the need of a complete apparatus for detecting variations of the current. With a millimeter we are made aware of the resistance offered and have a clue to work upon; in fact we are forewarned that we need not expect results without the expenditure of relatively much time.

The one hundred and ten volt lighting circuit seems to be losing favor for electro-therapeutic work because of its unsteadiness, and also the liability of short circuiting through the patient some of the wires carrying heavy voltage. Such accidents have occurred and one such experience is sufficient for most operators.

I will not weary you with the details of any special applications, as those can be best brought out by the clinics, but I *will* call attention to what has been termed by some "secondary electrolysis," and by others "metallic electrolysis." Neither term is to me expressive of what is meant, but I have not a better one to offer. The term "metallic electrolysis" is probably more suggestive of the method of using a soluble metallic electrode for the positive pole, for the purpose of manufacturing salts of that metal in the nascent state just where needed, and having the metal

carried into the tissues to some extent. A zinc electrode gives salts which are very coagulating; copper less so.

I have not had many favorable cases for the employment of this method, but I have seen some excellent results, and from theoretical and philosophical points of view it promises much of value.

SOME OF THE PRELIMINARY STEPS OF IMPORTANCE IN OPERATIVE DENTISTRY.*

BY GARRETT NEWKIRK, M. D., CHICAGO, ILL.

In this short paper, written hurriedly under pressure of time and various affairs, I shall not be able to present much that is new. My only excuse may be, perhaps, that the simplest, commonest and truest things are so apt to be ignored or lost sight of that they need constant repetition. The ten commandments bear to be often repeated and the Lord's Prayer never grows old.

What are some of the preliminary steps of importance in dental operations? We may say here that all steps in dentistry are of importance. Any one of them may have an important bearing on the final result, which shall be called success or failure. In no department of human endeavor is there required more careful attention to little things. It was said of old, "Take me the little foxes that spoil the vines." And with us they are the "little foxes" of neglect, haste, awkwardness, forgetfulness, laziness, indifference, minute defects that prevent the full development and fruitage of the professional vine.

I will speak first of some of the preliminary steps to the ordinary operations, where cavities are to be prepared and filled, with no special complications. The patient comes to "have his mouth put in order." There is first the examination. An important step is to make that examination thorough. To do this one must have time. It is better to make an appointment for it, especially if the patient be a new one to the dentist or if he has not visited the office for some time. From fifteen minutes to half an hour should be given for this, and a record of existing conditions made upon an examination tablet. We cannot trust our memories for all these things; there is no use taxing them. Paper blanks and pencils are for the saving of time and energy, and in-

*Read before the Northern Illinois Dental Society, Elgin.

surance of accuracy. The time spent in examination is just as valuable as any other time, and should be charged for, more or less.

It should be borne in mind, however, that a complete examination cannot always be made at one sitting. There are points which may be indicated as suspected by an interrogation mark, where wedging will be required for space to examine, and new discoveries are likely to be made during the preliminary operation for the removal of tartar.

A word as to instruments and modes of examination. One needs a good sized magnifying mirror, also a small mirror with an adjustable joint; dental floss, of course, for the discovery of any points not smooth on approximal surfaces; and there are no more important instruments from a purely business standpoint than two or three fine explorers. For searching out fissures there is nothing better than a piano wire broach held by an ivory broach holder or in a wooden handle. In examining the teeth it must be borne in mind that much will be liable to escape observation, and things that are seen will not be seen correctly if the surfaces are looked at in a wet condition. A cotton roll, or what I think is better a strip of heavy, coarse spunk should be placed between the cheek or the lip and gums. If the patient will keep his mouth steadily open the upper teeth may be dried, wiped with alcohol and thoroughly examined, without interfering moisture.

In examining the lower teeth it is often of advantage to have an assistant hold an additional pad, and at the same time employ the siphon for removing the saliva. Yet when we have done all this, using our best means of exploration, our examination will be incomplete very often with reference to special points until we have applied the dam, with separations, made either by previous wedging or immediately with Perry's or some like appliance. Having already intimated that in many cases a complete examination cannot be made without removal of tartar, I will now speak of this operation as one of the important things in a preliminary sense.

Were it not that clinical observation compels my attention to this point, I should take it for granted; I would assume that every dentist would naturally recognize the propriety of removing foreign substances from the teeth before proceeding to any operations, excepting of course those immediately necessary for the relief of

pain. But I see patients frequently in whose mouths extensive operations, often with gold, have been performed, while all about the necks of the teeth the accumulated deposits of a lifetime have been permitted to remain, with turgid and inflamed gums, or possibly pockets of pyorrhœa. There are many reasons why the removal of deposits and thorough polishing of the teeth should be the first of any series of operations, but I will dismiss the subject here with the simple statement that it ought to be to any one, I should think, evidently in accordance with the "eternal fitness of things."

Another important matter often neglected, as I am forced to believe, is the proper opening of cavities at the start for treatment primary to filling. Occasionally patients present themselves to me who have received treatment for aching teeth, with decay reaching nearly or quite to the pulps; treatment may have been merely for alleviating pain, or by arsenic for devitalization, and it is the general rule in these cases that the chisel has been used sparingly if at all. Thin, overhanging walls have been left, and the treatment has been attempted through a comparatively small opening. The cavity reminds one of an egg shell partly full of matter, base downward, with an opening in the smaller end. Now this is all wrong. It is easy for any one to see that those walls must be cut down to something like a solid base before the tooth will be ready for a filling.

Why not do this at once and have done with it? Do it with a wide, thin chisel along the lines of cleavage, a wide chisel because with a narrow one you run the risk of its plunging into the cavity and causing injury or pressure.

Sometimes the use of a corundum wheel, before the rubber dam is applied, so that it may be run wet, is the very best and the first step to be taken. The condition of a cavity cannot be determined unless there is room to work and see. Wherein is the good sense of leaving for days and weeks walls that are all in the way, that must ultimately come down? When these are cut away the decay may be peeled out with thin, curved excavators, Darby-Perry, or other like forms. One may thus slip under and lift up successive layers of decalcified dentine even to the pulp, often without the infliction of much pain. But no one can do this through a hole in the small end of a cone.

I am inclined to think that some prefer to leave overhanging

walls for the purpose of "holding in" their temporary stoppings of cotton or spunk which I often find in these cases. If so, they make a serious mistake. Cotton and spunk stoppings should almost never be employed. The overhanging walls are not necessary for filling with gutta-percha or Gilbert's stopping which will stick almost anywhere if we apply first a washing of eucalyptol or oil of cajeput, and with free access these stoppings may be made lightly, over cotton medicated dressings, without any undue pressure whatever. And this seems to lead me by a natural course to speak of temporary stoppings in general. If these are to remain for some time they should be of the red gutta-percha rather than the white, because they will wear out more slowly.

I am fully convinced that the average dentist does not use temporary fillings nearly as often as he should—that far too many cavities are opened up, prepared and filled at once.

First of all, a gutta-percha stopping may be made to perform the office of a wedge, surely and easily for the patient. It may be so applied as to crowd the gum away from cervical margins, allowing an application of the dam, and vision of the edge not possible at the first sitting.

In cases of near exposure of the pulp where there has been some degree of pain experienced either before or during the excavation of the tooth, and where an overlay of cement has been made at the deeper part, the gutta-percha stopping also gives time for the cement to harden without disturbance, time for testing the condition of the pulp, time for the allayment of previous irritation, time for soothing medication, time for the accomplishment of disinfection in the dentinal wall. It is not an unusual practice with me to prepare beforehand and so treat and fill temporarily from two to six cavities, without attempting one final operation. I believe the habit to be a good one. A consideration worth remembering also with reference to gutta-percha temporary stoppings as contrasted with cotton and varnish is this, that they are good for an indefinite period of time. If anything should prevent the return of the patient at the time appointed, and this will happen now and then, unavoidably, the tooth is safe—it is protected from infection, is kept comfortable, and not only this but the filling of the interproximal space; bridges over the gum preserves that from the pressure of food or any foreign substances. The gutta-percha

should in all cases be trimmed down so as not to be disturbed by the occlusion of the teeth.

One of the leading dentists of our State said to me about two years ago that during fifteen years he had not filled a tooth without the rubber dam. He was a truthful man and I would not dare to question his word. Whether or not he included all operations with plastic fillings on the deciduous teeth I cannot say. I did not think at the moment to inquire. I presume he referred only to operations on the permanent teeth, operations intended to be permanent.

I doubt if this gentleman had a higher appreciation than I of the value of the dam, but I should think his practice altogether extreme. Exceptionally there are times and places where it may be dispensed with. "There is reason in all things," so says the old proverb.

It is a pity when one becomes stereotyped in habit, even a good habit, so that he fails to recognize reasons pro and con, and can *never* see the exceptions to a general rule, for the rules which have no exceptions are rare indeed.

We may often apply the dam easily and with advantage upon the first molars or deciduous teeth in children from seven to ten years old, but in many cases as we all know, the attempt to use it would not be wise.

There are third molars where the best we may hope to do is to save them for a few years with amalgam or cement, singly or combined, teeth over which it would be difficult to place the rubber and hold it without a degree of torture to the patient unwarranted by the demands of the case. And we know that the cavity may be kept dry and a good operation done without the rubber. Our predecessors did such work and so can we. We have seen gold fillings, some in difficult situations, inserted thirty, forty and fifty years ago before the dam was dreamed of, and it is folly to say that we may not now insert a durable filling of amalgam or cement in those exceptional cases where there may be good reasons for avoiding the use of rubber or its associated clamp.

In this connection I wish to say that the great majority of the clamps offered the profession by the various dealers are ill adapted to their intended use, and many of them are unmitigated nuisances.

In the great majority of cases we do well to dispense with their use on all except molar teeth, and we may often do so with

them. I frequently use a clamp for a few moments only, just long enough to hold the rubber half way in position till I may pass the silk between the teeth, carrying the edges of the dam to place. I am almost sure to do this where I wish to use the Perry or Parr separator.

I will mention just one thing more with reference to the dam. Often due allowance is not made for the stretching of the rubber in passing over several teeth, nor for the interproximate distances in teeth well separated or bell-crowned; and the holes are punched too near each other. The result is that the narrow string of rubber slips up against one tooth or the other, pressing the gum not evenly and upward, but to one side; sometimes even constricting it and impeding its circulation to a dangerous degree. The strip of rubber between the holes should be about three and a half times as wide before use as the interproximate layer of gum.

I do not know that it makes much difference what sort of a rubber we use, whether light, medium or heavy, but it is a good thing to become accustomed to one kind, familiar with its working quality, and stick to that. For some years I have used Kleinert's, that varies a little between light and full medium weight, with a good deal of satisfaction.

And now I wish to speak of a step which I think is of importance, yet neglected by very many operators.

We will presume that a thorough examination and a record have been made, a sufficient shape secured; the rubber dam has been adjusted covering two, three or four teeth, and everything is in readiness to complete the preparation of the cavity for a gold filling. What next? The chisel, the excavator, or the burr? No! Wash those teeth with alcohol. A firmly rolled pledget of cotton or lint, or a hard bit of spunk, held by stiff pliers, dipped in alcohol, should be rubbed over the free surfaces of these teeth till they shine with a new luster. One who has not observed this rule will be surprised by the difference in their appearance. If the cavity or cavities be approximal, a slender rope of the lint should be passed back and forth between the teeth to insure clean margins. Where the secretions are unusually adherent it is well to dip the alcoholic cotton in pumice at the first, following with the alcohol only.

We ought not to operate upon unclean teeth; it is not necessary.

Any particle of foreign matter, especially organic matter touching the gold, or the instrument, or lying under the margin of the filling, is something which may impair the perfection of success, and should be avoided. There is no excuse for not avoiding it when we know how. It takes about one minute on the average to cleanse two or three teeth in this manner, and it is worth that many times over. It is simply nothing more than the idea of surgical cleanliness, recognized by every reputable surgeon nowadays in every operation he performs, and why should we do less?

It was my intention to say something about the steps preliminary to the regulation of teeth, but I opine that the paper has reached already its proper length. I have indicated sufficient, I trust, to evoke a good discussion in which perhaps that subject may be touched upon by some of those present.

A FEW SUGGESTIONS.*

BY DR. J. H. WOOLLEY, CHICAGO, ILL.

We cannot rely always on the judgment of the patient in diagnosing nervous affections that arise from dental irritation and it is my purpose to show the necessity arising for a knowledge of reflex action and reflex neurosis. One cannot speak dogmatically in considering reflex action, for our knowledge is limited on this subject and from the fact also so much lies in obscurity, the border line between conscious and unconscious action being difficult to determine.

It has been said, that like the brain, the spinal cord has its memory and must be educated, that the impressions it receives may be made lasting.

In Maudsley's words, "after the nerve force has been discharged, there is a certain waste of nerve material, but a subsequent regeneration or restoration of the statical equilibrium." This is quietly performed by process of nutrition, yet the nutritive repair following the track of the energy and coincident material change registers the experience. Every impression which is made leaves behind it, therefore, its trace or residuum, which is again quickened into activity on the occasion of an appropriate stimulus. The faculties of the spinal cord are thus gradually formed and matured. Many of the activities then of individual life are unconsciously performed. Walking is one of these involuntary acts.

* Read before the Northern Illinois Dental Society.

For example, a person may become so absorbed in thought as not to observe the distance passed over. Maudsley gives another instance, that of a person who had been suffering from a form of epilepsy known as *petit mal*, who continued the operation she was engaged in as of eating and drinking, unconsciously. Another instance, that of an amateur musician, who, while playing, was affected with epileptic vertigo, and went on playing unconsciously for fifteen seconds.

It can be said also of the earliest acts of an infant and the movements of the fœtus in the mother's womb. These are reflex to impressions.

The anencephalic infants show most remarkably by their acts, such as coughing, sucking and movements of their limbs, this independent power that the spinal cord has to direct movements, independent of consciousness. Goetz's experiment, tapping the abdomen of a frog, and thereby arresting the heart's action, is another example, also Tarchanuf's, who, upon drawing out a loop of intestine, with a corresponding mesentery from the abdomen of a frog, and exposing it to the air for a few hours, causing inflammation, showed that the slightest touch to the inflamed parts would cause a stoppage of the heart's action.

The impression made upon the inflamed part of the intestine is carried by nerve impulse, or an afferent current to the medulla oblongata, there reflected upon the vagus nerve and through it upon the ganglia of the heart.

Maudsley relates a striking experiment shown by Pflüger, who touched with acetic acid the thigh of a decapitated frog over its internal condyle; it wiped it off with the dorsal surface of the foot on the same side. He thereupon cut off the foot and applied the acid to the same spot. The animal attempted to wipe it off again with the foot of that side, but having lost its foot of course could not. After some fruitless efforts, therefore, it ceased to try in that way, seemed unquiet, "as though it was searching for some new means," and at last it made use of the foot of the other leg, and succeeded in wiping off the acid. When it had done that, the animal will remain at rest for hours, until some new stimulus is applied. It makes no spontaneous movements.

To carry this thought further, we will turn to dental irritation. Pain in a tooth does not always locate it as the seat of the trouble. It may be caused by the other teeth, or originate in other organs

of the body, by a current traveling from a diseased point toward a center, and by an afferent current to other teeth, not only exciting those, but other organs.

Many examples of reflex neurosis can be shown illustrating the effect of dental irritation, among them that of a patient having neuralgic pains in his right eye and locality of the infra-orbital nerve of the same side, caused by simple caries, relief being obtained after the decay was removed and the tooth filled. Another instance, that of a healthy Englishman who suffered from a right inferior molar tooth, its condition indicating pulpitis. Relief was obtained when a first right superior bicuspid root was extracted, showing necrosis of the root, which caused this reflex neurosis.

I recall the case of a lady in good health who had an attack of pain and numbness in her right arm and hand. She was unable to use her hand in writing. The pains occurred mostly at night, producing sleeplessness. The trouble was caused by a right superior wisdom tooth, the pulp of which was dead. After treating and filling this tooth she recovered. This same condition in the arm reappeared, but it was caused by a right inferior impacted wisdom tooth, by proper treatment of which the arm was restored to health.

Related as the teeth are to the alveolus, and connected by a dense fibrous membrane, supplied with its life-giving organs, such as blood vessels, arteries, lymphatics and nerves, considering the anatomical and physiological relation that both teeth and alveoli bear to one another, and the anatomical and physiological relation the alveoli bears to other parts of the head and face, it is reasonable to suppose pulpless teeth when not filled prevent healthy functional activity and produce diseased conditions in other parts of the body.

To serve the best interests of our patients we, as dentists, should study closely the pathological condition of dental irritation and reflex neurosis and nervous disorders. Careful investigation in this direction reveals the fact that decayed and pulpless teeth, painful or unattended by pain, are sources from which spring many diseases, the cause of which has in previous years been ignored and unrecognized. Many cases could be cited too numerous to mention that would support my argument.

Dental science has revealed to us the fact that a pulpless tooth is not necessarily a foreign substance in the jaw, because

the root can receive sufficient nourishment, or the cementum still nourish it through the periodontal membrane, and keep up its healthy functional activity after proper devitalization, and being well filled.

I would like to repeat again the rules I have made for myself, that may benefit some young practitioner. If these rules are properly observed they will serve as an aid to help one out of many difficulties.

RULES.

In the treatment of all pulpless teeth, I deem it easier, and the operation when finished, more successful, to cut the teeth away sufficiently to get a full view of the pulp chamber and approaches to the pulp canals of the root. With piano wire, out of which broaches can be made, the operator can explore and reach the apical foramen, without endangering the sides of the root, which he would be liable to do with drills. Engine drills are not under as perfect control as can be obtained with hand broaches.

The reason why the engine drills are objectionable is, that when the roots are curved near to their apex, the drill instead of following the abrupt curve, will pass through its angle. What is required, is a delicate sense of touch and deftness of hand; so necessary that a perfect control of the revolutions of the engine drill is not obtainable, and one is liable to pass through the sides of the root or abrupt angle of its curvature, which is not the case with hand broaches.

Broaches made of piano wire are superior to any that can be obtained elsewhere for that purpose.

The best results are gained in penetrating the pulp canal when the broach is not filed too small its whole length.

It should be left large enough to have sufficient strength fartherest from its end, to force it along the pulp canal, and as it binds, file it.

All broaches, before using, should be made thoroughly aseptic, and they should never be passed from one root into another without using the same precaution, to free them from aseptic matter.

My observations in the treatment of, and filling devitalized teeth, have led me to this conclusion, that there is no department in operative dentistry that requires greater care, skill and time. The question arises in my mind, as to whether nervous disorders and reflex pains do not often arise also from a too hurried prepara-

tion by way of septicizing, before filling root canals, and the imperfect manner in which the latter have been filled.

I know there are many who favor immediate root filling, but in my estimation the parts surrounding these affected teeth should be placed in a healthy condition, to produce healthy action and that requires thorough treatment. When one studies closely the pathology of devitalized teeth, particularly of troubles arising from putrescent pulps, he cannot fail to discover that the whole tooth and adjacent parts are poisoned by the effete matter passing off from the dead pulp. You may be able to cleanse the pulp canals, but the tubules of the dentine have absorbed the poison and it remains there.

In my opinion, heat used in connection with the treatment, is the greatest aid to the rapid decomposition of poisonous fluids and these gases, by drying out the tooth with a heated broach before using antiseptic, the latter medicine, not only passes well up into the canals, but is absorbed into the tubules, gaining by this process the direct and immediate benefit of the treatment.

Another point gained by heat, before filling the canals, is that it desiccates the tubules and an antiseptic dressing passed into them through the canal will embalm both the root and tubules; after absorption of the medicine, enough of the latter will be retained in the tubules to destroy any microorganisms left there and giving better results.

Proceeding further in the operation I deem it essential to absorb the surplus of the medicine, which, if remaining at the apex of the root canal requires too long a time to wait for it to absorb of itself. When the roots are filled with gutta-percha it should, when the operation is finished, be left with uniform density.

To the young men that are new in the profession I have offered these few suggestions as regards root fillings.

To conclude: Is there one unerring rule and guide in the treatment and filling pulp canals? My answer would be, that we all have come to the same conclusion, with respect to cleanliness and proper antiseptic dressings, freedom from moisture in the pulp canal and an indestructible material to fill the latter with.

PREPARATION OF CAVITIES IN MOLAR TEETH AND CONSIDERATION OF DIFFERENT FILLING MATERIALS.*

BY CHAS. J. SOWLE, D. D. S., ROCKFORD, ILL.

It is with no claim to originality that I present my views upon the preparation of cavities or in fact upon any other subject that I may see fit to bring before a society. I believe it would be a difficult matter for any dentist to justly claim originality upon any subject; while he may be the first to present an idea it is almost sure to have been practiced before. Many of our best dentists of to-day and those who are continually experimenting have but little to say, some because of inability to express themselves satisfactorily. Many a man has excellent ideas who is unable to put them in writing or present them to a society. Some prefer to keep them to themselves that they may have a slight advantage over



FIG. 1.

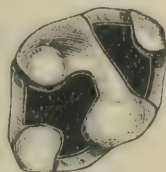


FIG. 2.

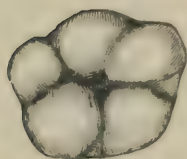


FIG. 3.

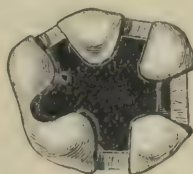


FIG. 4.

their neighboring dentist. Such a man is untrue to his profession, untrue to his people, and belittles himself in the sight of "God." It is every professional man's duty to do what he can to advance his chosen profession and thus benefit the community at large. I have prepared some drawings to aid me in making clear my idea. I think you will all agree with me when I say that the usual fee for a dentist's services is not sufficient to warrant the necessary time taken to insert the average amalgam filling. There is but one way to advance the price and that to do the work as it should be done.

I will admit it is folly for me to attempt to add anything new upon this subject after it has been so ably and recently discussed in some of the leading societies and handed down to us through the journals, but I wish to say something incidental to office practice.

The first drawing represents the occlusal surface of an upper

*Read before the Northern Illinois Dental Society, Elgin.

molar with pits and grooves as usually found. The second the same case with cavities prepared according to my idea, but somewhat exaggerated. The third, the lower first molar with its usual pits and grooves. The fourth the same prepared as above. This tooth as a general rule comes to us for treatment first and in a bad condition, therefore we should exercise our best judgment.

If in an examination I find the molar teeth but slightly pitted and grooved with an indication of decay at the pits, I do not hesitate to drill out pits, being careful to remove all enamel unsupported by dentine.

If on the other hand I find them deeply pitted and grooved with slight indications of decay at pits, I would not deem it advisable to cut out pits and fill, nor would I consider it good judgment to cut away good sound tissue to give cavity form, as shown in diagram, therefore I would caution patients and dismiss them.

Many cases come to us where the pits have been drilled out and pin head fillings put in, which would much resemble a pin were they withdrawn. In a short time the margins give way and the filling stands up like a post, around which food collects, hastening the recurrence of decay and necessitating the removal of the filling and form, as shown in diagram given to the cavity. Therefore I say wait until decay has advanced sufficiently to warrant this kind of an operation.

One of the greatest mistakes made in inserting compound fillings is the failure to cut away margins buccally and lingually, sufficiently to free them from any contact with the neighboring tooth.

In children, where decay acts more rapid, I should be tempted to begin operations much sooner than in older persons.

A few words in regard to filling material.

Gold ranks first in this line, and when properly annealed and properly condensed will withstand ordinary mastication without changing its form or breaking away at the margins.

In inserting small gold fillings where the force of mastication is seldom brought to bear I do not anneal my gold much on the start, as it works much more easy under the plugger and will adapt itself to the walls of the cavity more readily. In large contour fillings where the force of mastication is brought to bear more forcibly I anneal well from the start, believing that such filling should have a strong foundation.

In all gold work I use a shallow serrated plugger with a small

point and condense each piece well, not allowing the surface of my filling to become uneven, presenting a spongy appearance. At no time during an operation do I use a foot plugger. My experience has not been sufficiently long to say much in regard to amalgam fillings, but at present I prefer a coarse powder amalgam, comparing the same with a stone wall, the larger and harder the stone the stronger the wall.

There seems to be a difference of opinion among our leading professional brethren in regard to the mixing of amalgam and for fear there is an object I use the mortar, using as little mercury as possible and squeezing out excess with chamois skin.

In the insertion of all amalgam filling I build up well, grinding to its proper form at another sitting.

In any case where the cusp of an occluding tooth penetrates the body of the filling I do not hesitate to grind away a portion of the cusp rather than weaken the filling.

THE A B C OF MICROÖRGANISMS.

BY DR. ELGIN MAWHINNEY, CHICAGO, ILL.

Bacteriology is indeed a youthful science. Every year we are surprised at the astounding strides with which it develops, while day by day the world is lending to it a listening ear eager to recognize its important message to mankind.

To the average individual its lessons are poorly understood and most of our dentists are too busy with other things of seeming more importance to give the study it merits or the attention that is necessary to keep up with its growth. Recognizing this to be true, I have consented to address you on the A B C of microörganisms, trusting that by so doing I may encourage some to enter this most fascinating field of research.

I trust the older ones will bear patiently with me while I take the boys and girls through an exceedingly elementary lesson.

Microörganisms are minute microscopic organisms which we divide into the two great classes which include all forms of life, viz., animal and vegetable.

To define each class would be an exceedingly difficult task for the line that separates them is so vague and indistinct that it is almost an impossibility to tell where one begins and the other ends. All lower forms of animal life possess some vegetative

functions, while all low forms of vegetable life possess some animal functions.

I shall have but little to say of low forms of animal life this evening, but shall confine myself to a study of vegetable life.

We divide all plant life into two great classes known as the cryptogams (flowerless) and phanerogams (flowering).

The cryptogams we divide again into two classes, those possessing leaves, roots, etc., and those which do not. To this latter class belong the bacteria.

Bacteria are single celled microscopic plants and because they do not possess chlorophyl must of necessity live on performed organic substances.

The size of these cells are exceeding minute, an average length of about one twenty-thousandth of an inch. More than 400,000,000 of these cells could be spread over one square inch in a single layer. Think of it a moment, a population of 200 times greater than Chicago on a single square inch.

These bacteria are made up of a more or less dense membrane enclosing a protoplasmic mass. In common with all forms of life they possess the power of maintaining their individuality against considerable odds. They possess the power of nutrition, growth, reproduction and special functions. Of all these powers the only one well performed is that of reproduction. It is perfectly astounding to watch with what rapidity they multiply; begin with one plant which reproduces by division and one will have over 16,500,000 at the end of twenty-four hours.

Many bacteria have the power of motion, more especially is this true of certain forms, bacillus and spiral, which is accomplished by cilia hair like projections along the sides or at the end. They swim slowly, they turn about, they roll over, they glide swiftly, stop suddenly, sway to and fro until you become weary watching them. They appear under the microscope as pale, translucent masses, and the student usually finds it advantageous to stain them in order to be able to study them closely. This is done by the use of analine dyes, red, blue or violet. When once stained we are able to isolate them from surrounding tissue and obtain separate colonies.

Most of the known bacteria can be cultivated upon artificially prepared media, such as agar agar, beef broth, gelatine, etc. Many forms can be grown in room temperature, others higher; others

require as high as the body temperature for their growth and reproduction. By means of these cultures we are able to isolate separate colonies of single species, by first planting in tubes well distributed throughout the media, and when growth has begun by means of sterilized platinum, transferring a small portion of what appears to be a single colony to a dry slide culture, then allowed to grow again, when by the aid of the microscope, trained eye and hand, we can "go fishing" and obtain a single specie which is again planted in sterilized media, care being taken to avoid contamination from without.

This in simple form is the process of isolating for the purpose of study.

We divide bacteria into three main classes according to their external appearance :

The coccus or berry shaped.

The bacillus or rod shaped.

The spirilla or spiral or screw.

Coccus occurring in pairs we call diplococcus. A cluster of coccus we call staphylococcus from their resemblance to a bunch of grapes, and when they occur in chains we call them streptococcus.

Bacillus in chains we call leptothrix. They multiply in three distinct ways, viz., by spores, by division and by a portion becoming detached.

Many are of the opinion that the formation of spores is the last act of the life of the plant as in the higher order of plant life. As the plant has run its course all its vital energy is pent up in a small mass dense and difficult of destruction. In some plants these spores are formed within the plant itself, others are formed at the end.

The process of division is best seen in the bacillus.

First the plant begins to elongate, then a slight constriction about the center appears, and by and by it becomes still more fashionable and laces still tighter until it is completely separated at the center, and instead of one we have two well formed plants, each endowed with all the capabilities of the other.

We again classify them by their use or disuse of oxygen in three classes: Aerobic—with air—anaerobic—without air—and facultative aerobic—with or without air.

Again we divide them according to their action in relation to animal life, into pathogenic and nonpathogenic.

A pathogenic bacteria has the power of producing disease, a nonpathogenic has not as their names imply.

The question now arises as to how the pathogenic germs produce disease, and where and of what value are the nonpathogenic forms?

Let us look into the latter question first. We shall presently see that they are everywhere present, and as each created thing must have a purpose in its life, these low forms of life must have. Wherein does it lie? Let us look.

We have already stated that all forms of life possess among other qualifications the power of nutrition, which in bacteria consists of first, the power to prepare certain organized matter for assimilation, and second, that of assimilation, and third, the formation of waste products. All bacteria do not live on the same food, nor do they give off the same waste products. Indeed all forms of life, be they low or high in the scale of evolution, are veritable analytical machines.

Man as the highest earthly type is constantly performing analytical tests. We distinguish between sweet and sour by taste, between fumes of ammonia and aromatic odors by smell, etc. Now this same analytical power is possessed by bacteria to a very high degree. Among the array of chemical reactions which constitute the science of chemistry none is more familiar than the conversion of sugars into alcohol.

There has been no race of men, so far as I know, that did not possess this power. Although this change has been known for countless ages, it remained for Schwann, about fifty-five years ago, to discover that this change was brought about by minute oval shaped organisms, and to Pasteur we are indebted for showing that success in the process of brewing depends on the purity of the culture used for that purpose, so that now the various kinds of fermented liquors are each produced by a specific germ. There are now many large laboratories which prepare and supply the trade with these pure cultures in the form of special yeasts.

It had long been supposed that man was the only consumer of alcohol, but science has demonstrated otherwise. For although but few, if any, organisms are capable of living in the results of their own waste products, yet such products furnish a suitable media for the growth and development of other forms, hence we find the germ of acetic fermentation living and developing in weak alcoholic solutions, and hence our vinegar as a result.

It is not alone in the domain of alcoholic and kindred fermentations that bacteria are useful for day by day we are finding them at work everywhere, here preparing the soil for other vegetative processes, and there destroying and breaking down the remains of dead animal and vegetable substances, and were it not for these the earth would soon be cumbered with the dead of other days, for it is they that bring about the process of putrefaction and decay.

Without their aid the soil would soon become useless as a producer of vegetation, for they are the fertilizers; by converting the nitrogen and nitrogenous substances into nitric acid, which is essential to the growth of higher vegetation. This work is now known to be the result of the life of two distinct organisms, one converting ammonia and the like into nitrous acid, the other converting this into nitric acid.

And so on and on through the ever varying changes of life we now recognize these little, ceaseless workers making for the weel of the human race. Indeed, without them all life would become extinct, and this beautifully and wonderfully productive world would be a cold and barren, lifeless moon, serving only as a reflector of the light of other worlds in this great universe.

We are ready for a study of the pathogenic varieties, and we return to our former question as to how they produce or cause disease. Before attempting to answer this question, I ask you to follow me through a short study of the higher forms of life. In man life begins in a single cell which, though harboring potentialities of the highest type, is nevertheless not unlike the little cells of which we have been speaking.

This cell, under suitable conditions, divides and subdivides, forming a cluster all looking alike. Next they form themselves in layers; some of them change their forms now, and develop special capacities, and so on and on until we have the complete body, composed of a mass of cells all coördinated together into a perfect, harmonious whole.

Now some of these cells have acquired the ability to do special things, and have lost other powers in so doing; and have advanced to a higher type of existence. Then others remain in a comparatively low state of development.

The muscle cell in infants is a comparatively simple cell, endowed with the powers of nutrition, growth and reproduction. As it develops it gradually loses some of the powers, and has retained

some in a less state of activity, and has gained new powers; for example, it has acquired the power of doing work, and has almost entirely lost the power of reproduction. It has no longer the power to take up crude food, but this has to be specially prepared by other cells, and brought to it by still others, etc., etc. This gives rise to what is known as a division of labor among cells. Thus we see that all the varied structures and functions of the human body are but the combined expression of the structure and lives of the cells that compose it.

Among the simplest forms of cells in the body are the leucocytes, little white cells floating hither and yon, to and fro in the blood current; now in the current and now wandering out of it among the muscle fibers, apparently obeying no law except the force of its own inner life. Yet it has a purpose in its life, and among these it acts as a scavenger, carrying away used up waste material to the organs prepared for ridding the body of such; and again, they act as tissue builders. Now we are coming to a point where we can consider the production of disease by bacteria.

For clear illustration let us take a simple injury. What occurs? First we see these leucocytes darting through the vessel walls by ameboid movements. These leucocytes take direct course to the seat of injury, and begin their delicate, intricate process of repair, the detail of which I should like to discuss did time permit. Next we see the wound fairly alive with bacteria; a veritable battle ensues in which the strongest survive.

All pathogenic bacteria give off waste products, known as ptomaines, which are more or less poisonous to animal cell life. In addition to this we have also referred to their digestion. From these bacteria emanates a digestive fluid, for they have no digestive organs within themselves, consequently digestion must and does take place without the body.

Now this digestive substance aids them in breaking down organized cells. But similar powers are possessed by the leucocytes, for they actually do take up and digest apparently these bacteria. In addition to this the leucocytes have helpers among the bacteria themselves, for they fight among themselves and only the fittest survive. Now if the animal cells are victorious in the conflict we have healing of wounds by first intention or without pus formation.

This is a very crude representation of what takes place in all

infectious diseases. In these various conflicts that take place in infectious diseases if the animal cells survive they are less liable to be conquered by future attacks, and the same is true of varieties of bacteria, if one variety destroy another they usually ever after conquer new foes in that same variety.

Now it is just here that science has been most helpful.

Scientists observing these facts set about experimenting, which have resulted in these facts : First, we are able to inoculate the animal with weak attenuated colonies of a particular infectious disease, and by a little care the animal will survive with but little difficulty, and consequently be protected from serious results during future attacks (vaccination with cowpox). Second, we have found that in many cases if we take the ptomaines and inoculate the animal in like manner we will get a similar result, viz., immunity from serious future attacks. Third, by studying the enmity between certain bacteria we may be able to inoculate the diseased animal with the antagonistic bacteria who may be comparatively harmless and thus effect a cure. To illustrate these points:

The process of vaccination with cowpox as a protection against serious results from smallpox was invented by Jenner from an old custom of inoculating children with smallpox in its mildest form in order to prevent them from taking the severer form. The results you are familiar with. Pasteur, that most wonderful scientist, has developed this same principle in weakening the growth of hydrophobia germs, and use these cultures as a means of combating this disease with such astonishing results.

If time would permit I should like to take you through the long line of most brilliant experiments by which we have reached our present knowledge of this phase of bacteriology.

Bacteriology as I stated in the outset is only in its infancy, and who can foretell the results of research in the next quarter century.

There are certain conditions necessary to the production of infectious disease. Our neighbors may suffer and we escape, although we mingle with them. We may live among these germs and yet go free. And why?

First, these germs must enter the body tissues in order to produce harm.

Second, having gained an entrance they must find suitable conditions for their growth.

In order that we may see from what sources they enter, let us study the sources from whence they come and how they are carried.

Bacteria are found in the air floating on particles of dust and their numbers vary according to: first, nearness to earth's surface; second, temperature; third, density and activity of the population, and fourth, moisture of atmosphere. Prof. Frankland in a series of experiments found that at a height of 300 feet in 2 gallons of air 7 were found at 180 feet, 9 were present, while on the ground 18 were present in 2 gallons of air.

The farther out to sea we go the less we find them, until finally they disappear. The same is true as we go down below the earth's surface.

They are more abundant during August, and during rainy days but few are found, as the moisture prevents the dust from rising.

The density and activity of population increase the numbers floating. In a room before a ball experiments showed only forty-four fell on a square foot per minute, while during the dancing 400 were found to fall on the same space.

In a room during flail threshing 8,000 fell on a square foot per minute.

In the air we find almost all varieties, and of the pathogenic variety we especially find those of diphtheria, smallpox, tuberculosis, pneumonia, yellow fever. The liability to acquire any of these diseases is always increased in direct proportion to the crowding together of sick and well, hence we see why infectious diseases create such havoc in our crowded and unsanitary portions of our large cities.

The greatest blot on the civilization of the nineteenth century is in allowing such unsanitary conditions to exist.

Now that the untiring efforts of science have shown us these things which make for the woe of mankind what are we doing to help ourselves. The microorganisms in water have been a source of interesting study for many years.

The numbers vary according to the source and surroundings. Spring water is almost free from them, while wells fed from surface drainings are thickly populated.

In the Chicago river water upwards of 20,000 have been found in twenty drops.

Most of the bacteria found in water are harmless unless

present in too great numbers. More than 100 in a teaspoonful might act as an irritant to the digestive tract simply on account of their numbers. However in water many of the pathogenic varieties thrive, such as typhoid bacillus, comma Asiatic cholera bacillus. Others such as bacillus anthracis of wool sorters' disease—splenic fever—on being introduced into drinking water only lives a few hours, while its spores live indefinitely even in distilled water. It follows then that drinking water obtained from surface drainings are a source by which these organisms enter the body. A process for purifying the supply of large cities is now in process of completion which will prove helpful in the extreme. It consists of an apparatus for the manufacture of ozone on a large scale and forcing it into and throughout the water at the intakes. The rapidity with which these organisms in water multiply is simply astounding. In water taken from a deep well seven were immediately found in twenty drops. After standing one day at a temperature of twenty-three c. twenty-one were found and at the end of three days 495,000 were found.

From the numbers we see in air and water, from which sources we are constantly taking them into our bodies it would appear to the casual thinker that higher life would be impossible. But there are other things to be considered: First, our normal lungs are provided with brush like arrangements which constantly screen the incoming air and send back the microbes, and the healthy body is capable of digesting those that enter the alimentary canal, or at least throwing them off, as the eminent scientist professor proved by swallowing Koch's comma bacillus of Asiatic cholera in great numbers. Then something else must be essential. What is it?

First, there must be a predisposing cause, either inherited or acquired. Second, there must be a lesion of some kind, a break in the lining or covering of the body, or third, an undue irritation of some kind, which conditions may be brought about by all sorts of causes varying all the way from mental fear or dread to the severest traumatic injury.

We now encounter the question as to how we know these low forms of life producing disease. If in health the body possesses the power to throw them off, how do we know they actually do cause disease? Koch lays down as a crucial test that certain conditions must be fulfilled before we can positively assert that a given organism is the specific cause of a disease. These are: It must

be found in all cases of that disease ; it must be found in no other disease ; and, it must appear in such quantity and be so distributed that all symptoms can be accounted for by its presence ; also that the bacteria must be capable of being isolated from the diseased tissue and be grown on some of the artificial culture media and when injected into an animal must be capable of producing the disease.

Although all of these conditions cannot always be fulfilled, yet the constant presence of a certain definite single variety in a given disease renders it highly probable that it is the cause of the disease. With most of the best known, such as those of splenic fever, tuberculosis, smallpox, etc., have been cultivated, and in every way stood the tests.

So far as our definite knowledge can lead us, it seems as though the law of evolution as seen in animal cells does not obtain. The offspring of the vegetable mother cell is always identical with herself, and does not ever seem to pass from one specie into another. Each variety seems to ever remain the same. Although many seem to be able to change from nonmotile to motile and vice versa, yet we never see a pus-forming microbe becoming anything but that; and likewise throughout the whole bacteria. For example, the streptococcus of erysipelas shows no tendency to become streptococcus of pus formation, etc., although they are quite identical.

Besides the attributes already mentioned as belonging to bacteria, some possess in addition most remarkable powers; for example, bacillus prodigiosis can, by combining countless myriads, produce most beautiful color on different culture media. Not many years ago priests used to make use of this for the purpose of convincing the ignorant that the sacred wafer had been visited by the divine hand; it being kept in a warm, damp room where these bacillus abound soon became covered by a bright red growth which resembled blood. Hence, if blood was present on the wafer, who could put it there but deity himself.

You will readily see from what has been said regarding the omnipresence of these little organisms that we will find many varieties in the mouth. Let us look at a few of them for a moment. Bacillus of tuberculosis very narrow, rather long rods, slightly rounded at the ends. We are not certain as to how it reproduces, but seemingly by central spores. The pecu-

liarity of this bacteria lies in the fact that when once stained it cannot be discolored, which fact can be used to distinguish it from other like forms. We find there also those of typhoid fever, diphtheria, and a host of others that cause infectious diseases; but time will not permit me to dwell on them longer.

According to Miller, we have six varieties found in the mouth quite constantly. These are *leptothrix innominata*, *bacillus buccalis maximus*, *leptothrix buccalis maxima*, *jodococcus vaginatus*, *spirillum sputigenum*, *spirocheta dentium*.

The *leptothrix innominata* is found in the soft, white deposits on the teeth in every mouth, but by no means always in the same numbers. They appear as small inarticulate threads varying considerably in length, broad, twisted and tortuous; and usually mixed with this variety we find two other varieties which consist of chains of cocci and thick bacillus. These latter stain to a blue violet, with a solution of iodine in iodide of potassium, while the *leptothrix innominata* becomes yellow. These two varieties are what Miller terms *jodococcus vaginatus*, and the *bacillus buccalis maximus*.

The former, *jodococcus vaginatus*, occurs in considerable numbers in all unclean mouths. It occurs in chains of 4-10 cells; these chains are surrounded by a sheath in which the cell appears as rounded disks. Occasionally chains are found in which one or more cells have escaped from the sheath.

The *bacillus buccalis maximus* appears in the shape of isolated distinct threads running parallel or sometimes crossing one another. This bacterium is the largest occurring in the mouth, it has a regular contour or the same thickness throughout.

The *leptothrix buccalis maxima* I think may be regarded as different cells of the same variety, the only difference appearing is the looseness of their articular joints.

The *spirillum sputigenum* occurs in every mouth but in varying proportions according as cleanliness is neglected.

It occurs in the shape of rods curved like commas which show very active spiral movements. It inhabits the unclean mucus on inflamed gums.

It was long considered as identical with cholera comma bacillus, but by a long process of experiments Dr. Miller succeeded in showing differences, according to its behavior while growing on gelatine and the effects of certain reagents upon it.

The *spirocheta dentium* is not found in decay, but under the free margins of the gums. It grows in the form of irregular spirals, some thick, others thin.

Besides these we have an endless variety which so far as known cannot be cultivated and consequently little can be said regarding them.

Those of surgical diseases are known as pyogenic varieties.

Principal among the pus producers are the *streptococcus pyogenes* (Rosenbach), which occurs in spherical shape and usually grows in pairs in the form of a rosary chain. The manner of distinguishing them from those of *erysipelas* is that mice can be inoculated with it forming abscesses, while mice cannot be inoculated with those of *erysipelas*.

Then we have the *staphylococci pyogenes* (Rosenbach) *aureus*. This one is most commonly found in pus and is considered most virulent. They are small cocci arranged in irregular groups, producing a beautiful orange color on culture media. It grows rapid and is hardy and most difficult to destroy of all pus varieties.

Then we have the *staphylococcus pyogenes albus*, or white, which shows no tendency to produce color on any culture media.

There are several varieties of this same specie, each producing different colored pus, but these are most important, as one or the other or all of these are found in most all abscesses with which we have to deal.

Bacillus tetoni, lockjaw. Large narrow rods with rounded ends reproduces rapidly by end sporation, drumsticks. It gives rise to the most poisonous product.

In the decay of teeth we find many varieties from the simple cocci to the *bacillus leptothrix*. There are many things we have yet to learn about decay. In a few words the process is this :

Particles of food belonging to the carbohydrate group lodge in the out of the way places of the teeth, in the fissures, or other irregular places, between the teeth and remain long enough to ferment. These particles of food may be in perfect solution.

In the process of fermentation our little bacteria here as everywhere play the important part.

The varieties above referred to lodge, and finding these suitable conditions awaiting them, they set up the functions of their life, namely, digestion, assimilation, reproduction and the forma-

tion of waste products. The waste product, a violent, irritant and destroyer of tooth substance.

Just exactly how all these phenomenon of dental decay take place we are not exactly certain. I am quite satisfied that the digestive fluid of which we have spoken elsewhere plays an important part, at least in destroying the animal matrix of both enamel and dentine, while the lactic acid waste product dissolves out the lime salts. When the enamel is once broken the process is more simple.

The bacteria actually penetrate the tubuli of the dentine and there flourish. Indeed some of the cocci variety penetrate the tubuli before any softening of the lime salts takes place.

This is the simple process as we now understand it.

I shall not have time to touch on the diseases of peridental membrane, except to say that Drs. Talbot, Miller and others do not think we have any specific organisms in pyorrhœa other than the pus-forming varieties.

RECAPITULATION.

We have seen what bacteria are, where they live, how they reproduce their kind.

We see them everywhere aiding in the economy of the universe, as man's invisible friends, without which higher forms of life would be impossible.

We have seen something of the manner in which they produce disease.

We have seen that certain conditions are necessary to their growth and functioning.

We have stated that it is impossible for them to produce harm in the healthy animal organism where the functions of full and perfect nutrition are correctly performed.

We have stated that the body is composed of minute cells all coördinated into a perfect harmonious whole, and that one condition for the development of bacteria is that these cells must become lowered in their vitality.

Now as a final thought, do we give enough attention to the preëxisting causes of disease which lie in the animal cells of the body? Is not the life and vitality of these cells all important?

In our treatment of infectious diseases, surgical or otherwise, have we not run wild on germicidal treatment which is simply in-

tended to destroy germs regardless of action on the animal cells of the body or on the nutrition of the body as a whole?

I urge in future that we think of these things more, and our treatment though not less potent as destroying bacteria, will be more helpful to body cell development. Let us always remember that many things which destroy bacteria also destroy the processes of repair.

SOME INDICATIONS FOR SYSTEMIC TREATMENT IN DENTAL PRACTICE.*

BY E. L. CLIFFORD, D. D. S., CHICAGO, ILL.

I do not feel called upon to repeat at this time (what I have often before expressed) my full appreciation of the rights and duties of the practitioner of general medicine. In my daily practice, I guard with jealous care his field and his prerogatives, at the same time, it is my effort to be fully posted as to my own sphere and position. No one appreciates more than myself the good will and influence of medical men, and the truth of which assertion I substantiate with the fact that a very large percentage of my practice comes through that source. That they seek my advice and services, and grant me their influence, I attribute to frequent associations and consultations, which lead them to believe that I have given time and study to a branch of practice which they, to a great extent, have neglected or ignored. It is my experience that the practitioners of general medicine are only too willing and anxious to be relieved of, or assisted in, such cases as in this day of advance they have been led to believe belong to the specialist. I desire to usurp nothing to which I am not rightly and justly entitled. My association with physicians does not always lead to my assuming control, but by intelligent consultation we have found that we can work together to our mutual benefit and to that of the patient. And I take it, the fact of the proper medicine being exhibited by the physician after consultation constitutes no less the necessity for systemic treatment in dental practice. But one fact I am certainly assured of, that when the physician finds that we have looked beyond the tooth, in the abstract, when we have studied cause and effect, and can give his educated and appreciative mind an intelligent diagnosis and treatment, we have woven

*Read before the Chicago Dental Society.

another link in the chain that binds us together, have added another round to the ladder that raises us and our specialty in his estimation. As stated in a recent paper, we would not contend that it is within the province, even though his ability justified it, for the practitioner of dentistry to assume the responsibility or to presume to treat any of the special constitutional diseases. His experience, a most important factor, would justify no such assumption, to say nothing of his inability to devote the proper time, care and attention to such cases. But, when the results and sequelæ of constitutional general pathology invade the realm of the oral cavity, they have then stepped within our domain and we should be able to recognize their approach, and to baffle their onward progress.

Now, I have previously said that in the treatment of diseased conditions three principal objects should be kept in view. First, to remove the cause, if possible; second, if not possible to remove it, to obviate or ameliorate its effects by placing the patient in improved physiological condition, making him better able to resist the onward course of the disease; and third, to make the patient as comfortable as possible while we are exercising our skill and ingenuity to hasten recovery. This very statement if you will but study it for a moment, carries with it the conviction that we, as specialists, cannot always accomplish all three of these considerations. We may not be able, or it may not be within our province, for instance, to remove the cause, said cause being located beyond our sphere. Not being able to remove the cause, the same reasons might, and often do, apply to the second general object in many cases.

As specialists we may be unable to give the time and care necessary to place the patient in improved physiological condition, thereby obviating or ameliorating its effects. That is to say, it would be beyond our province to undertake control of the constitutional disease; but this very condition would prove the necessity for systemic treatment, and the facts of the dental specialist having recognized the cause in a proper diagnosis, and through his knowledge and training in general therapeutics knowing the treatment required, is certainly practicing and acknowledging the indication for systemic medication when he refers his patient to the family physician for assistance.

Where these manifestations of general pathology, however,

localize within the oral cavity, the patient applies for relief to the dentist, not to the physician. He applies to the dentist because, as I have said, he believes he is suffering in his teeth or oral tissues from a cause located therein.

His unpracticed and inexperienced mind, of course, does not allow him to draw correct conclusions, he only perceives the irritation at the point of manifestation and he applies to the dentist for relief. The ability to render that relief is the key that will open the door of gratitude and success to the practitioner who possesses the power. This ability to give the relief mentioned, we place under the third heading of our generalization of making our patients as comfortable as possible, as soon as possible. And when the causes are so remote as we have mentioned, can we pin our faith and our hopes to local treatment. Having discovered the cause and knowing the treatment that will relieve temporarily, though it may be, must we tell the patient yes, we know, but we dare not act, we must refer you to the physician who, as I have already hinted, has completely ignored this branch of study and who consequently is absolutely incompetent to intelligently prescribe, except with the advice and assistance of the specialist—?

I have used the word "temporary" in speaking of relief. In our application, excluding natural therapeutics, of systemic treatment I am of the opinion that the extent of this application that would reasonably come within our sphere, must produce, in the very nature of the case, but temporary results. Not having been able to remove the cause, the effect will of course return and in this respect will differ greatly from the results we obtain from the accepted treatment of the day when the cause is purely local, and consequently the indications for local treatment fully recognized. Hence you see our efforts to baffle onward progress of disease will sometimes be confined to advice, sometimes to direct application of remedial agents. The conclusion as to which is proper in a given case must of necessity be decided at the chair, but the indication for proper systemic treatment was just as patent in the one case as in the other.

If I can read correctly between the lines some most excellent additions to our recent literature, show the experiences, and the reasons for such experiences, of those who find, or think they find at least, some assistance in their daily practice from systemic treat-

ment. We all will acknowledge perhaps that this is one of the subjects that has grown rapidly of late and that now seems of intense interest to the student of inquiring mind.

For the purpose of this evening we will conclude that all treatments not strictly topical are systemic, whether found in the category of natural or applied, rational or empirical therapeutics. Recognizing, as I believe we all do, the beneficent influences of all applications of natural therapeutics, and about which I believe there is no dispute, I will dismiss that branch for the present and devote what time we have to the use or abuse of pharmaceutical agencies. I do this because I believe that it is this branch of treatment that is now arraying itself upon both sides of a most interesting and important subject.

Coming to the point, the question upon which we are seeking more light at this time is: Are there those in the practice of our specialty to-day, who believe that they can best promote the interests of their patients by the use of systemic remedies? Are they getting better results from such practice than they could obtain without them? If so, what class or classes of remedies are most used to obtain these results, and what are the indications for their exhibition? Has experience taught those practitioners who seek the aid of systemic treatment that specifics exist, which might be tabulated for the benefit of routinists, for each pathological condition that might present itself for consideration?

To the first portion of this divided question, unless we doubt the absolute honesty of some recent contributors to our literature, contributors for whom we otherwise entertain respect and in some cases even reverence, it would seem we must accept the fact that they are using general medication. In examining the literature we find it a truth that a great majority of this class are those whose preparation for their life work has been built upon the foundation of general medicine. Their knowledge of life and function seems to have suggested to them the value of these assistants, their acquaintance with the fundamentals of general medicine justified them in entering the field of experimentation, their experience and cultivated perception enabled them to select that which was useful and to eliminate those that were harmful or useless. True, the subject is yet young—the “truth of to-day” has not yet been established but I am not prepared to believe that there are no grains of wheat hidden in the immense amount of

chaff that has been thrown for our digestion. It seems to me we must admit that our entire medical armamentarium has been given us by the general profession, whether its use be by topical or systemic application. Have we selected from this large storehouse all that can be utilized, or is it our duty to follow them in the future as we have in the past and grasp every new idea or agent brought to the light that can help either us or our patients. A recent, and justly respected writer, respected because we believe him to be an earnest and honest seeker for light, one whom we know accepts no dogmatic statement without reasons or proof. On the other hand, my confidence in his energy, his capacity and his determination to know for himself, prompts the conclusion that he would reject no statement as erroneous, no suggestion as useless without giving it the advantage of scientific test and trial—states that “the use of drugs by the medical profession must be the basis of our reckoning; their teaching, must of necessity largely modify our conclusions,” that “the tendency of the medical profession to give drugs is on the decrease.” To the first portion of this quotation I have already acquiesced—to the latter I regret that the same acquiescence must be withheld. A moment’s reflection must but convince my friend that a special place and a special shelf must now be provided in the great and fast increasing number of our pharmacies for the massive editions of our latest dispensatories. Compare also, the bulk of the last pharmacopœia with that which first saw the light a decade before. True, many eliminations have been accomplished but the additions have so far outnumbered them that the offspring has taken on the appearance of being father to the parent, and these eliminations have not in all instances, nor in a majority of instances, resulted from the fact that the agents had proved useless, but more often may be attributed to later researches in medical chemistry which has furnished us with more potent, certain and more palatable medicines. The tendency also toward monopharmacy, which in a great measure has supplanted the old methods and practices of polypharmacy would lead us to suppose that so far as number is concerned our list would decrease. The observer, however, I think must conclude that the reverse is the case. There are certainly more medicines, both as to number and variety, produced to day than ever before. Why are they produced? The answer certainly must be that a market exists for them. The list of individual drugs in each

class of remedies has certainly increased. Thank heaven no one prescriber would find it possible to use all of them, but out of the great variety, he is enabled to select a smaller number to meet the usual demands. To this I would willingly subscribe. I do not believe that each individual prescriber uses so great a number of different remedies as in the past, but taken collectively do believe that the amount of drugs annually poured into the stomachs of the human family is something appalling. This even, however, would not prove that there is no time and place for the proper remedies. I would not be understood as believing that the conditions, or the agencies to meet those conditions, are many that would come within the realm of the practitioner of dentistry. While I use and recommend some systemic treatments, the conditions nor agents are numerically great, and the brother practitioner who condemns the practice of the dentist treating constitutional disorders in general can have no fight with me.

I would regard the field of practice to which the specialist is entitled more in the light of emergency cases and would claim that his duties and province are at an end when the emergency is conquered, for instance, when a state of comfort and quiescence is obtained.

The third and last question relating to specifics has been answered in my first paper, and hence will be dismissed here. This brings us to the consideration of my second question, what classes of systemic remedies have been found useful and what are the indications for their exhibition?

For want of space and time we must dismiss that period of time antedating birth and during infancy or very early childhood; not for lack of importance for we believe it of sufficient importance for an entire paper, but for the sake of argument we will for the present leave that period to the family physician, admitting that custom and practice has almost entirely relieved us of that responsibility. Our efforts will be directed entirely for the time being to office practice and consequently to the period of life after the time that the patient is usually brought to us for consultation. We will also ignore in our classifications those agents which are recognized as strictly topical in their application.

The class of remedies which we believe to be useful and essential to the dentist are :

First. Stimulants and sedatives, subdivided into diffusible,

cardiac, respiratory, vaso-motor, cerebral, hepatic and intestinal stimulants; vascular, cardiac and nervous sedatives. These might again be subdivided, but for the purpose of this paper are sufficient—though some of the divisions to which we will later refer would very properly be found also in the above divisions, such as narcotics, hypnotics, analgesics, anæsthetics, antispasmodics, etc.

Second. The restoratives or agents acting on metabolism promoting constructive metamorphosis.

Third. The alteratives, which by their tendency to the promotion of destructive metamorphosis, assist in the absorption of inflammatory products or other materials of morbid origin apparently by stimulating the lymphatic system.

Fourth. The antacids or alkalies, antilithics and diluents, diuretics and alkalizers of the blood and urine.

Fifth. Diaphoretics and sudorifics.

Sixth. Sialagogues and antisialics.

Seventh. Antipyretics, antiphlogistics and antiperiodics, and some antizymotics.

Eighth. Purgatives, laxatives, etc.

Ninth. Antidotes and antagonists.

Tenth. Astringents.

As to the first classification, any agent which excites the organic action of any part of the economy is known as a stimulant, the preceding adjective designating which organ is to be acted upon. For prompt but transient effect, and indicated usually when time is precious, veritably an emergency case, the diffusible stimulants become extremely valuable. No dentist of to-day would probably be held blameless whose case did not contain alcohol, ammonia, camphor, nitrite of amyl, nitroglycerine or an electric battery to excite the brain, lungs or heart to immediate action; and also might be mentioned as valuable under the different headings of stimulants such agents as morphine, atropine, strychnine, digitalis, chloroform, ether, etc., all more or less indicated in conditions of depression liable to occur within the office of any dentist at any time. Again, going to the other extreme, there are conditions of excitement and exacerbation of nervous tension to which no dental practitioner is a stranger, and upon the control of which depends no small part of his influence upon his patient, and consequently his ultimate success in his calling. For help under such conditions he naturally turns to his class of

sedatives to exert a soothing influence on the system by lessening functional activity, depressing motility and diminishing pain. Here the narcotics and anæsthetics play an important part, and unfortunate indeed is the medicine case that contains not its bromides, opiates, aconite, gelsemium, digitalis, general anæsthetics, etc., etc. This, for a generalization, will probably be sufficient to cover the ground of cardiac, respiratory, vascular and cerebral stimulants and sedatives, with the statement that the indications for their use are probably just as liable to occur in the office of the dentist as the physician; and the question, what would be the status of the dentist who failed to recognize these indications or who failed to apply the proper remedy at the proper time? We still have upon our list of stimulants the hepatic and intestinal. For our purposes both may be treated in one. A torpid, sluggish liver or a clogged, congested intestinal tract is certainly an indication for systemic treatment, and one, too, about which we will have no dispute. As to who should remove that obstruction there may be some difference of opinion. The condition existing, and proving an obstruction in the way of the dentist to establish ease and comfort, I should hold that the exhibition of the proper remedy came within his province, as accomplishing two of the three ends aimed at in the beginning of this paper. So many effective aperient waters and so many pleasant preparations are now at our command for this condition, and so quickly will they come to your minds, that we pass without starting to name a list that would be long if we only mentioned a small proportion.

I stated in the early part of this paper that most of our patrons come to us for relief; and the existence of pain, soreness, or any uncomfortable condition within or traced to the oral cavity makes the division of narcotics most interesting to us. A condition of nervous tension brought about by a period of insomnia, caused most probably from the presence of pain, would certainly be an indication for anodyne treatment, which would, by relieving the pain, allow sleep and promote recuperation. On the other hand, an extreme sensibility to pain, or any irritating influence caused by a condition of the general nervous system superinduced by a protracted period of insomnia, would be as certain an indication for the exhibition of the hypnotics. The cabinet should therefore contain for such purposes (or prescriptions should be written for) the bromides (I prefer syrup brom. com.), chloral

hyd., croton chloral, sulphonal, chloralamide, trional, lupulin, acetanilid, phenacetine, antikamnia, and if we included the entire list of new remedies and many old ones belonging to this class we certainly would tire or disgust you. The conditions which would indicate the administration of the general anæsthetics, which we take it, no one will deny is general systemic treatment *par excellence* and of the most dangerous kind, we do not deem it necessary to enumerate to this audience. We recognize that it is disputed by some that the dentist has the right to administer these agents. This is not the subject before us at present; but should the operator, in case of accident, be able to show ordinary ability, care and precautions, I would have no fear of the court's verdict. I cannot dismiss this heading, however, without stating that the occurrence of any untoward symptoms during or following the state of general anæsthesia would be a most patent indication for vigorous general systemic treatment.

As to restoratives:—Food is one of the essentials of all life. "It differs from medicine, in that it is introduced into the body to supply some material, to renew some structure, or to maintain some vital process, while medicines modify some vital action but supply no material to sustain such." Man draws upon all three of the kingdoms of nature for his food, which includes many substances treated of in the *materia medica*; for instance, the oils and fats, sugar, starch, gum, alcohol, water, phosphate of lime, chloride of sodium, etc. A deficiency of any of the elements essential to a proper food, or a failure on the part of the organism to properly assimilate those elements will be manifested by defective structure owing to incomplete or vitiated nutrient fluids.

The integrity of the blood must be maintained, and although our hæmatines prove useless, or even deleterious in health in certain diseased states, they tend to improve its quality and consequently the nutrition of the entire organism. This defective structure extending to the teeth is very truly an indication for systemic treatment in order to get the best results for the masticatory apparatus. This systemic treatment, however, should be referred to the physician with suggestions from the dentist as to the condition existing and the results desired to be obtained.

To the alteratives, all branches of surgical practice owe an appreciable debt. While we cannot explain their exact mode of action the benefits derived from their use is but an additional evi-

dence of our inability to exclude in toto empirical applications. Many of the lesions brought to our notice are of an inflammatory origin or nature, and if in our list of agent we find those whose effects are to remove the products of inflammation, we are fortunate indeed, to be possessed of such assistants.

For their antiseptic properties and especially their power to increase oxidation, we turn to the chlorine group of this class. Sulphur certainly has lost none of its reputation as an adjunct in this line of treatment, and to Ringer we bow in gratitude for the introduction of calcium sulphide as one of the most valuable alteratives in all classes of inflammation not of specific origin. A therapist of national fame recently states that "the clinical value and extended uses of this drug have yet to be learned by a large majority of the medical profession."

Let us remember that its line of action and its effectiveness in certain directions depends largely upon its dosage and methods of administration. While the powers of this class of agents indicate the value in dental practice, they are mostly to be received from the hands of the physician. A just appreciation of them, however, will often assist the specialist in cases where a temporary effect is desired and only short terms of administration required.

The fourth class of antacids or alkalies, antilithics and diluents, diuretics and alkalinizers of the blood and urine, will greatly assist the specialist in his effort to reestablish function, but with few exceptions, the indications for their use should enlist to our aid the patient's physician, permanent benefit therefrom, requiring continued use and watchfulness.

The above will as aptly apply to our fifth class diaphoretics and sudorifics and to the benefits we may derive from their help.

Our sixth class comes a little nearer home, their effects are more truly and noticeably *within our realm*; the sialagogues and antisialics. It is possible that as much annoyance is felt by the patient possessing a mouth too dry or too moist as almost any other one pathological condition, and I presume most of you will agree with me that either condition should be placed upon the list of indications for systemic treatment. Pilocarpus, potassium chlorate, atropine, the iodine and mercurial preparations and others thus become agents for our consideration and use.

Our seventh class, antipyretics, antiphlogistics, antiperiodics and some antizymotics, will render to the dental specialist valua-

ble assistance. If properly understood and temporary effects required we would place them within the reach and province of the specialist. If on the other hand, continued use is indicated, they should be relegated to the physician.

Our eighth class, purgatives, laxatives, etc., have been sufficiently dealt with under the head of intestinal stimulants.

Our ninth, antidotes and antagonists become of graded importance to us in proportion as we practice both local and systemic medication. Their indications and their values are the same to the specialist as to the general practitioner, but we would claim that as all specialists do, at times, use some agents whose careless or ignorant exhibition, or the presence of an unknown idiosyncrasy within the patient might produce unpleasant or alarming results, it is his duty to understand their action and to be fortified with their presence.

Our tenth class, astringents, we make in addition to those used for their effect upon the alimentary tract to be brought into use in cases of suspected, threatened or present hæmorrhage. The possibility of the dentist being confronted at almost any time with a troublesome and persistent hæmorrhage makes this class extremely interesting and important.

And now, at the risk of severe criticism and justly appreciating the statement before made, that it is difficult to particularize; but in order to furnish ample food for discussion, I make an attempt to tabulate some of my indications. Please do not forget the word "some" in the title of my paper. Very probably some valuable and suggestive indications will be omitted.

I have intimated that the general practitioner and the specialist can best act in conjunction. I therefore arrange two lists of conditions for your consideration. The first containing those requiring the assistance of the physician; the second, those in which I believe the specialist is justified in acting.

INDICATIONS FOR SYSTEMIC TREATMENT.

Conditions which affect the oral tissue but should be referred by the dentist to the physician and treated by him.

1. Defective structure and malnutrition.
2. Excessive acidity of the gastric and oral secretions.
3. Adynamia, or loss or deficiency of vital power.
4. General and persistent anæmia and emaciation.

5. Stomatitis resulting from indigestion.
6. Congenital or acquired diseases of the bones.
7. Catarrhal conditions depending upon constitutional causes.
8. Nervous excitability or depression with oral manifestation.
9. Constitutional disturbances incident to fractures, necrosis, gangrene, tetanus, pyæmia, etc.
10. Oral manifestations coincident with or dependent upon cachexia; gouty, rheumatic, catarrhal or specific.
11. Oral manifestations continued by the influence of malaria, hysteria, pregnancy, or the menstrual function.
12. Oral manifestations dependent upon irregular or imperfect general hygiene, diet or ventilation.
13. Oral manifestations due to drug poisoning, *i. e.*, mercury, lead, phosphorus, etc.
14. Fetid breath, the cause of which is not located within the mouth.
15. Chronic or persistent constipation.
16. The diseases incident to first dentition.
17. Facial paralysis.
18. Hæmophilia.
19. Almost all surgical cases extending beyond the alveolus should be treated in conjunction with an M. D., especially if the dentist does not possess that degree.

Those conditions in which the dentist would be justified in the use of systemic medication and treatment as an adjunct, or assistant to his topical efforts.

1. Temporary nervousness from apprehension, fear or suffering.
2. The presence of pain, where prompt though temporary relief is demanded, the cause of which local applications will not reach.
3. Hypersensitiveness of the teeth due to acid secretions.
4. Afterpains resulting from dental operations.
5. To anticipate or prevent narcosis.
6. Threatened narcosis.
7. Acute vascular congestion.
8. Acute intestinal congestion.
9. Acute pulmonary congestion. (The last three causing dental disturbance.)
10. Oral manifestations due to cachexia (for temporary relief).

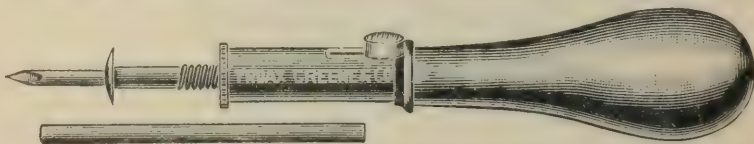
11. All forms of odontalgia, due to malaria, rheumatism, gout, menstrual disturbance, etc. (for temporary relief) advising the patient to consult the physician for permanent benefit.
12. Many of the divisions of stomatitis, scorbutus, etc.
13. To assist in equalizing the circulation in cases of acute inflammation, such as pericementitis, periostitis, etc.
14. To prevent or hasten suppuration.
15. To fortify the tissues against the results of suppuration, necrosis, etc.
16. Many phases of trigeminal neuralgias.
17. Facial paresis.
18. Where hæmorrhage is expected.
19. When hæmorrhage is present.
20. A severe cold affecting the oral tissues.
21. Irritations from difficult dentition.
22. Ptyalism (to a degree) and dry mouth.
23. Engorgement of the sinuses.

A NEW TROCAR AND CANNULA WITH SAFETY GUARD.—FOR OPENING THE ANTRUM OF HIGHMORE, THE PLEURAL CAVITY IN HYDRO- AND PYO-THORAX, AND FOR OPENING HYDROCELES, CYSTS AND LARGE ABSCESSES.

BY JOHN S. MARSHALL, M. D., CHICAGO, ILL

This instrument was devised with a view to prevent accidents in the opening of the cavities of the antrum, the chest, cysts, hydroceles and large abscesses.

There is always danger when puncturing the antrum of Highmore, the thorax and other cavities which are filled with fluid ab-



normal in character, and which must be evacuated, of the trocar under the force sometimes necessary to puncture the tissues forming the walls of these cavities, injuring the organs contained within them, or of passing through the opposite wall, and causing injuries to structures beyond.

To render such accidents impossible this instrument has been fitted with a safety guard entering the handle or the instrument by

means of a screw thread, which makes it possible for the operator to set the guard so that the trocar and cannula will enter at any depth that he may judge will be the thickness of the walls of the cavity to be punctured, without fear of injury to the important structures within or beyond. The handle also contains a device operated by the thumb, which throws the cannula forward, covering the tip of the trocar and allows the trocar to be withdrawn, leaving the cannula in position.

Its construction is such that the parts are easily separated, and rendered aseptic by boiling.

Charles Truax, Green & Co, are the makers of the instrument, to whom I am indebted for the mechanical perfection of the idea.

36 WASHINGTON STREET.

PROCEEDINGS OF SOCIETIES.

CHICAGO DENTAL SOCIETY.

The regular monthly meeting was held November 10, in the Jewelers' Association rooms, and was called to order by the President at 7:30 P. M.

The following paper was read by Dr. E. L. Clifford on "Some Indications for Systemic Medication."

DISCUSSION.

Dr. E. MAWHINNEY: Ever since being informed by Dr. Clifford day before yesterday that I was to take part in the discussion, I have been trying to satisfy my mind as to the reason why I was selected for it, and I cannot think of any other reason except that Dr. Clifford perhaps is afraid of some of our other friends who do not think just as he does, because you are all well aware that I have already committed myself very positively and very definitely upon the subject of systemic medication in a paper read before this society early this year. I am very glad, however, to bear my testimony along this line of thought for many reasons; first of which is the fact that the study of systemic medication necessitates the study of general pathological conditions and general physiological conditions, all of which broaden the mind of the dentist. For if there is one thing that I feel as though the profession needs, perhaps not here in Chicago, but in

general, it is a little broader outlook upon the field of medicine, so that I am very glad that we have had the privilege of listening to the interesting and instructive paper that we have had from Dr. Clifford.

I was thinking as he was reading the paper, that perhaps there would be no harm to mention two or three things which we believe in, and if you think but a little all of you will believe in, because it seems it is almost a patent fact, and that is, when for example we have a special manifestation in the mouth of a systemic disease that does not manifest itself elsewhere, that is the first place it called your attention to, in the mouth, then the individual who follows up that case is the man who begins in the mouth, who sees the first sign of it and who follows it back, and though the cause is entirely removed, I ask you, is it reasonable for you to expect a man who devotes his time to other things than manifestations seen in the mouth, how are we going to expect him to diagnose and treat a manifestation that comes within our sphere only? Though it be systemic it seems as though we either must treat those cases through the physician, that is to say, we working through the physician, or else we must treat them directly if we expect to get the best results. I do not wish it understood that I, for a moment, wish to usurp the position or place rightly filled by the general practitioner or any of the specialists in the broad field. I like to practice my profession as a specialty, purely as a specialty. Now we have often local causes coming within our direct sphere which manifest themselves markedly upon the whole general organism. True, when we remove the cause in some cases, systemic recovery is immediate, but in others it is drawn out, it extends over a period of time and it seems to me that the man who best can treat that is the man who thoroughly understands the cause. It seems that way to me.

Now, for example, in any of the severe acute inflammations, we never have an acute inflammation in the mouth without it making a general systemic disturbance. Now we may remove the irritation, if the inflammation be the result of local irritation, yet as I have stated before (and you are all thoroughly familiar with the fact) that even though we do remove that local cause, we have these general systemic conditions which are relieved, of course, as you understand by stimulating the excretory functions, the eliminations of the waste products and the poisonous materials which are backed up into the system from local causes.

Again, last evening it was my privilege to present to the Odontographic Society a few facts, a sort of A B C of microorganisms and in that I tried to throw out a thought that has impressed itself very forcibly upon me and that is the fact that disease depends upon more than one thing for its cause usually; that in our craze for local manifestations resulting from microbic infection, we have gone to the extreme of treating those diseases wholly by directing our attention toward destroying, killing if you please, the most important organism. As a matter of fact most of those microorganisms cannot be destroyed locally without destroying also the animal cell, and that animal cell, the health, the vitality of it is the most important factor in bringing about recovery from any disease and consequently I threw out the thought that the coming line of practice was going to be directed not perhaps less in the direction of disinfecting or germicidal treatment, but more perhaps—not less in that direction—but decidedly more along the line of stimulating the healthy growth of the reparative cells. And so it seems to me in a general way, in order that we shall stimulate the growth of these reparative processes, I think you will all admit with me that to do so we shall have to enter the system to do it, not altogether cause local stimulation, but we must stimulate the whole circulatory and excretory functions if we are going to stimulate the health and growth and reproductiveness of the animal cell.

It was moved by Dr. Haskell that this paper be passed, which motion prevailed.

Dr. HARLAN: The very exhaustive paper of my friend, Dr. Clifford it seems to me should have received more consideration at our hands, because it was one involving even greater interests than the one that I shall present. I am convinced that a certain amount of systemic or internal medication is an absolute necessity in the practice of dentistry. I am very glad to say before reading my paper that I was very much entertained and instructed by that of Dr. Clifford's.

ODONTOGRAPHIC SOCIETY OF CHICAGO.

DISCUSSION OF DR. MAWHINNEY'S PAPER.

Dr. E. L. CLIFFORD: It certainly requires a good deal of fortitude to try and open a discussion on a paper of this kind, without preparation, before a body of scientific men. But with a charitable inference from Dr. MaWhinney, I might say that in such a question as this there is certainly some benefit to be derived, and the principal benefit to a class of specialists is the practical application of such study as Dr. MaWhinney has evidently given it. He started out by saying that he would take the A B C of bacteriology. He has touched, here and there, on almost the whole field of microorganisms. It is of course pretty hard to confine oneself to the A B C and get any practical application of such a subject. He has given us a tremendous subject. If his paper is the A B C, we could not take the entire alphabet in a number of years, and in fact the scientific world, so far as we know, is yet in the alphabet, they have not left that portion of the subject.

One or two thoughts suggested themselves to my mind, and as the doctor only slightly touched upon them, and as many of the members of this society, especially the younger men whose practice does not give them time to go quite as deeply into scientific studies as do some of the older ones, I will take the liberty of making one or two practical applications.

Dr. MaWhinney has told us what the microbe is, he has given its general divisions. Those of us who have read some of the papers written by members of our society, as well as by members of the general profession, if we noticed the nomenclature used by the writers, and if we understood the subject as Dr. MaWhinney evidently does, would realize that there has been a very great misuse of the terms that should be used to designate the meaning intended to be conveyed. Let it be one of our practical applications to take the grand divisions the doctor has made, classifying the microorganisms under their proper heads, and selecting that which is of especial interest to the medical profession, under the general head of bacterium, divide that again into the cocci and the bacilli, and then the different divisions of the cocci, such as the diplococci, the micrococci, the streptococci and the staphylococci, according as they range themselves. And when we come to use these words in our writing let us not use the word bacilli when we mean cocci or the general term bacterium, when we mean to designate some

of the special divisions of bacterium. In other words, to that extent that it belongs to our profession, let us understand that bacteria is a general term and that the cocci and the bacilli are divisions of that general term, the bacterium itself being a division of a good many ante-divisions and they being subject to a great many post-divisions. The practical application I would make here is our study of the terminology and nomenclature in this field that will make us write and speak more intelligently.

Another application the doctor has touched upon is our efforts in the warfare against these microorganisms, as to what we have found and what we feel is absolutely necessary to do in order to conquer them. The doctor took up the higher life and stated that even man is an omnivorous animal, he lives on everything and could live on almost anything, but he needs a great many different kinds of things. We must have air, we cannot live without it; we must have water, we cannot live without it; we must have a certain temperature, if carried above or below it we cannot very well live. Let us make that application to this division of vegetable life. Those who have made a study of the subject have learned by investigation that there are certain elements absolutely necessary to the propagation of organic life, we might take three as especially necessary. We will exclude a predisposing cause as being an etiological factor in the production of disease, because otherwise we would have to start with the fact of there being a preëxisting microbe. But after the entrance of the microbe there must be a suitable media for that organism to live upon, there must be a proper temperature for the propagation of that organic life, there must be a suitable moisture. It might seem absolutely necessary, to some of us, in order to stop the pathological effects of the microörganic life to destroy all three of these elements. But that is not the case, no more than it would be with man. Take the air from man and he dies; destroy the moisture necessary for his life and he dies; destroy the temperature and he dies. So in our efforts to treat disease, even though we acknowledge the extreme importance of the etiological factor of the microörganism it is not necessary for us to destroy all three of these elements. If we can destroy either one of them it is enough. If we destroy any one of these things we destroy the power of the microörganism to propagate its own and thus destroy that etiological factor in the production of disease. If, for instance, you can make a tooth per-

fectly dry microorganisms cannot propagate in it. If you take that tooth and destroy the moisture there that is necessary for the microorganism to live on, you destroy these organisms, or if you could change the temperature in that tooth to a sufficient degree, you could remove another factor. I bring this up to show the value of dryness, the value of getting the root canal or the root itself absolutely dry before we attempt to fill it, because if the microorganism is an etiological factor, no matter whether it is *the* one or not, in the production of disease, we have removed that factor. That seems to me a practical application, which of course might be enlarged upon in each of the divisions I have mentioned.

It seems to me I have not heard anything for a long time that has done me so much good, and has made me feel, with those in our profession who have given the subject scientific study, and have gone on to reason from cause to effect that we should absolutely do nothing or say nothing without having a reason for it. I am becoming more and more convinced every day that there has been more damage done in the past in treating teeth than has been done by letting them alone. Teeth have been overtreated, that is teeth containing putrescent pulps or teeth that are devitalized. I believe that when we get the root canals in a proper condition is the time to fill them and we can do that as well or better, in the majority of instances, in a short time as in a long time. Because of the close relationship existing between the animal and vegetable cells, because one is so interdependent upon the other, because of the continuity of life in the two cells so closely allied one with the other, you cannot use sufficiently powerful medicines for a long enough period of time to completely destroy all of these vegetable cells without doing damage to the animal cells, and when you have broken down the animal cells that by continuity make up the surrounding tissues in the part you are trying to cure, you have created another pathological condition worse than the one you are curing. Nature has got to make up for the loss and consequently you have terribly hard work. Many of us have seen, and probably it has scared a great many of the younger members of the profession, after placing a crown upon a tooth, and especially after filling a pulp canal, the patient returning in four to eight hours with the tooth pretty sore, and the novice believes that he has not done his work properly, and that he must remove the filling and do it over again. Not necessarily so, I take it; nature in her

effort to repair the damage done to the animal cells, is trying to assert herself in a certain regenerative action. The first steps of what used to be called inflammatory action is absolutely necessary and we have some of the clinical signs of inflammation. If you will only give nature a chance you will find that she has reasserted herself and your work has been done for you and you need only assist nature by proper systemic treatment.

Let us make some practical applications from such papers as this, let us go home and investigate a great deal more. It is refreshing to hear a paper occasionally that is not on amalgam fillings or gutta-percha. Let us broaden ourselves; what the profession needs to-day is broader dentistry, and when we come to that sphere of broader life in our profession each and every one of us will be an integral part of that better state of existence.

Dr. GEO. J. DENNIS: In his discussion of the paper Dr. Clifford brought out one point in regard to the conditions necessary for the growth of bacteria that struck me very forcibly; namely, the three conditions of moisture, temperature and the materials necessary for the growth of microorganisms. It struck me that the thing we do when we sterilize teeth, or any other tissues, is the partial destruction of the matter upon which microorganisms grow; that is, we change the ground in some way by means of our sterilizing agents. Seldom do we use heat enough or dryness enough to interfere very materially with the growth of microorganisms. It is true that in the use of root dryers a certain amount of heat and a certain amount of dryness is produced beyond that in which microorganisms grow or reproduce themselves, but in a short time the dryness is dissipated and if these microorganisms have been in the condition known as spores, where they resist this difference in temperature and difference in moisture more than they do when they are simply plain bacteria, then the extremes of temperature and dryness that we use in treating pulp canals would have very little effect. Again, if there are bacteria deep in the tubuli of the dentine as represented in the drawing Dr. MaWhinney has given from a section prepared by Professor Miller, it certainly is true that our heat does not penetrate to the depth necessary to destroy these bacteria, neither does the dryness extend to that point, because we know that the root of a tooth, beyond a certain limit, is never completely dry. I looked over the subject a little before coming to this meeting, and one division of the

bacteria seemed to me to be particularly interesting, that is the division which recognizes that some microörganisms have their field of work entirely upon dead tissues, and that others deal entirely with living tissues. The first are those that produce the putrescent changes, the fermentative changes and reach out after the highly organized materials and return them again to their original simple conditions into such forms as ammonia, carbonic acid gas, etc., that plants may be able to take up these materials and organize them into more complex ones. While those that deal with living tissues seem to simply have the power of breaking down living tissues, and simply only live by injuring other tissues. While the paper claims to be only the A B C of microörganisms, it seems to me that it covers the entire ground so thoroughly that unless one were a deep student of the subject he could scarcely discuss it reasonably well.

Dr. J. E. NYMAN: One interesting point in the paper to me is the fact that one microörganism, or the product of it, seems to be antagonistic to another microörganism. That has been illustrated to some extent in the treatment of carcinoma by the toxins of erysipelas. Medical men have found that a microbe flourishes in tropical countries, which very often is the active cause in starting either epithelioma or carcinoma. I had a very close friend who, after living a number of years in Central America, suddenly developed epithelioma. He came under the care of Professor Kocher, of Berne, a man whose reputation is world wide, and he told my friend that without doubt if he had been living in a northern country, where these microbes are unknown, he would never have suffered from epithelioma. I was talking with a medical man in New York the other day who, with a brother physician, is treating a case of carcinoma of the hip with erysipelas antitoxin, and it seemed to be holding the disease in check. It is in such a position that they do not dare operate.

Dr. F. S. BUCKLEY: Although I could add nothing of real value to this very complete and elaborate paper, I have been very much interested and it has brought vividly to mind the lectures I was privileged to hear while studying with Professor Miller in Berlin. While Dr. MaWhinney was speaking of bacteria in the mouth I recalled how Prof. Miller obtained these results. At the close of an afternoon lecture he asked the members of the class to deposit a little saliva in a prepared culture medium. Later the

separate sections of the large amount of culture medium he had prepared for about forty students were placed in his laboratory and the results were given us later on. I well remember with what glee Prof. Miller told me I had six or seven different kinds of bacteria in my saliva.

I am sorry to bring you the news that Prof. Miller has been seriously ill. I received a letter from Mrs. Miller a few weeks ago which said that his head had been in such a serious condition that he had not been able to even read a letter since January. His practice, study and scientific researches have of course been entirely discontinued for many months, which has however been the case three or four times during the last five years, although he has only reached his fortieth year. He has worked too constantly for several years. A point I thought might interest those present is that I have one of Prof. Miller's slides of carious dentine which I should be glad to place in the hands of the members of the society for examination if a microscope could be provided.

I begged the slide just before leaving Berlin and Prof. Miller picked one out with considerable care and gave me what I presume is one of his best.

Dr. WOOLLEY: I would like to ask Dr. MaWhinney a question. Supposing this culture tube can be made to represent a single root, the coloring down its length and middle, the pulp canal branching off at right angles from the canal, the tubuli. If the canal and tubuli be made absolutely dry, and before proceeding to fill, we flood both with a strong antiseptic, after which we absorb what medicine remains in the canal, and proceeding further by filling the pulp canal to the foramen, do we not seal in the remaining antiseptic in the tubuli, thereby destroying any microorganisms left there?

Dr. E. L. CLIFFORD: Dr. MaWhinney spoke in his paper about the bacteria of pus, and I would like to ask the members of this society to look in the mouths of their patients for the chromogenic bacteria that is around the gingival margins of the teeth, spoken of by many dentists as the brick dust or red variety. I would like to have the members of the society for a year count the number of patients they find with the red variety of chromogenic bacteria on the margins of the teeth, and I would like to have them ask these patients whether they are in the habit of using, or have used in the past any kind of soap as a dentrifice. The

chromogenic bacteria are attracting a little attention and some ideas have been advanced that we would like to prove or refute.

Dr. Wooley's question, as I understand it, is that if you fill a tooth and it is properly filled, no matter if there is something back of it, bacterium or pus, can we naturally look for reestablishment of physiological function; in other words, the removal of the pathological lesion, which would amount of course to a cure. Dr. MaWhinney has stated in his paper that pathological bacteria have no effect upon healthy animal tissue. The scientific treatment of disease is to first remove the cause, and the balance follows. Nature will take care of herself and a cure will result. We claim that alveolar abscess is caused by putrefactive agencies in the tooth, if we can remove them, and there are no complicating conditions, such as pockets, necrosis, etc., recuperative power being at par, the abscess will heal, and it won't heal unless you do remove them, because in the tooth it is imbedded in the bony structure; we have not the blood vessels, we have not the lacteals, we have not the lymphatics, nothing to carry off waste tissue, and if you cut off the cause from the body politic, from that portion that is supplied with blood vessels, with lacteals and with lymphatics, you obliterate that abscess as thoroughly as if you extracted the tooth. Many times when you extract a tooth you do not get the abscess, but if you succeed in removing the cause and your patient is at par, in other words there is proper recreative power, the lacteals, blood vessels and lymphatics will carry off the pathological lesion and the abscess will be thoroughly cured.

Dr. E. MAWHINNEY, in closing the discussion, said: First, in regard to the statement of Dr. Woolley and Dr. Clifford as to the return to physiological processes after the filling of the root. Immediate root filling resolves itself into this: Dr. Clifford's statement is true. We do have absolutely no trouble provided we have no pocket or detachment; no denuded root in the apical space. If the lesion be severe enough it may be necessary to interfere from without, which I have found to be a very simple and easy mode of treatment. However, I can conceive of the danger of too rapidly shutting off that means of medication, resulting in acute conditions which are necessarily painful. Except in these few cases I think Dr. Clifford's position can be maintained.

With regard to Dr. Woolley's statement about the material remaining in the tubuli, I have long been of the opinion that it is necessary to disinfect the tubuli. If the tubuli be large and the

anastomosing branches with the peridental membranes are large, that will invite foul material to remain in them, and we will have a tooth that I call sick; a tooth which will, when the general forces are reduced, be tender, sore, unstable. Not a tooth constantly sick and causing violent pain, but a tooth that is not in perfect health. I think there are very rarely sufficient microorganisms present to cause acute disease, but they will cause a condition which cannot be considered a perfectly healthy one. I have such a tooth in my own mouth. I know the apex of the root is filled, and the canal is filled; but when I am not well that tooth is not well, and when I am well the functions of the tooth are well performed, and I never give it a thought.

This subject of bacteriology is so interesting and fascinating to those who give it any thought that I wanted to invite your attention to it. It is not a subject I am especially fond of, for to me it presents the gloomy side of life; and in this world of ours we have so much that is gloomy that I like to be refreshed with the bright side of life, as we have it in some of our recent literature, in the writings of Ian Maclaren, who presents the beautiful, bright side of life. I am very fond of the bright side, and I study bacteriology only because it is so fascinating that I cannot let it alone.

I thank you for the kindly treatment you have accorded my paper, which I still feel is about "The A B C of Bacteriology;" and when some of you have studied the subject you will find that such is the case. It has made wonderful strides in the field of surgery and infectious diseases, which I have not touched upon; and to the researches of these eminent men, who deny themselves much, science owes an everlasting debt.

NORTHERN ILLINOIS STATE DENTAL SOCIETY.

The ninth annual meeting of the Northern Illinois Dental Society was held at Elgin on October 21 and 22, 1896.

The meeting was called to order on the first day at 10:30 A. M., by the president, Dr. H. C. Gill, of Rockford.

The roll call showed twenty-one members, which number was augmented during the meeting to about fifty.

At the morning session the President read the annual address, and a paper entitled "Prosthetic Dentistry of To-day" was then read by Dr. E. H. Allen, of Freeport. Both these papers were discussed, after which the society adjourned.

At the afternoon session a paper entitled "The Illinois Dental Law" was read by Dr. W. J. Phillips, of Elgin; also a paper on "Iodoform in Dental Practice," by Dr. Louis Ottofy, of Chicago. Both these were generally discussed, after which the society adjourned and visited the Hospital for the Insane.

At the evening session Dr. W. V-B. Ames read a paper on "Cataphoresis." Dr. Garrett Newkirk, of Chicago, read a paper entitled "Some of the Preliminary Steps of Importance in Operative Dentistry."

These papers having been discussed, the society adjourned.

Thursday morning was devoted to the following clinics: Application of the rubber dam for difficult cervical margins, W. H. Taggart, Chicago. Bleaching a tooth with 25 per cent pyrozone, E. H. Allen, Freeport. Obtunding sensitive dentine by cataphoresis, J. H. Woolley, Chicago. Gold filling, M. L. Hanford, Rockford. Gold filling, J. P. Carmichael, Milwaukee. Flexible edged rubber plate, W. V-B. Ames, Chicago. Porcelain faced bicuspid, all soldering done with Bunsen burner, no investment, A. H. Peck, Chicago. Preparation of roots and setting Logan Crowns, Chas. J. Sowle, Rockford.

It was impossible to secure a case for a surgical operation for Dr. T. W. Brophy, of Chicago, who was present and prepared to perform his part as one of the clinicians.

At the afternoon session the following papers were read: "Preparation of Cavities in Molar Teeth and Consideration of Different Filling Materials," by Dr. Chas. J. Sowle, of Rockford. "A Few Suggestions," by Dr. J. H. Woolley, of Chicago, and one on "Systemic Medication," by Dr. E. L. Clifford, of Chicago.

The society contributed \$75.00 toward defraying the expenses of the scientific investigations conducted by Dr. G. V. Black, of Jacksonville.

Rockford was selected as the next place of meeting. The election of officers resulted as follows: E. H. Allen, President, Freeport; C. B. Helm, Vice President, Rockford; James W. Cormany, Secretary, Mt. Carroll; M. R. Harned, Treasurer, Rockford. Executive Committee—Louis Ottofy, Chicago; C. W. Cox, Batavia, O. A. Chappell, Elgin.

The president appointed Drs. Bryant Kerr, J. E. Harned and G. A. Furman, all of Rockford, the local committee of arrangements.

The society adjourned to meet in Rockford in October, 1897.

THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY

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THOS. E. WEEKS, D. D. S.

A. E. MOREY, PH. B., D. D. S.

THOUGHTS ON VARIOUS TOPICS.

Toward the close of every year the thoughtful mind reverts to what has been accomplished in the world's annual march toward the close of this eventful century. The year which is about to close has been one of much activity in the development and progress of dentistry. It has witnessed the superb work of J. L. Williams, and the equally valuable labors of G. V. Black; one on the structures of the dental organs, and the other on their physical characteristics and also the properties of metals. The subject of electrical osmosis has occupied the time of many experimenters. It is really in its infancy, and already it opens up vast possibilities not only as a benumber of sensitiveness of dentine, but in a wider therapeutic sense. The perfection of methods of doing porcelain work has received new impetus from successes already attained. The study of past history has shown that many of the things considered new are only revivals of past knowledge on many subjects. The X ray is a valuable discovery, and it seems now that we are about to realize some benefit, as well as the general surgeon. Many obscure lesions are to be brought to light by its aid. In literature—purely dental and scientific—much has been done by industrious experimenters and compilers. The periodicals in this and other countries seem to be growing more valuable from year to year. A new impetus has been added to magazine articles by that growing class of well taught and thoroughly interested additions to our ranks from the larger curriculum, and the selection of fitter material to enter professional life. In every line of work we may congratulate ourselves that so much has been accomplished

in the twelve months of 1896. The two subjects of great importance to all mankind, the treatment of irregularities and deformities and pyorrhœa alveolaris, we opine has filled the pages of more journals in one year than in the past four years. It is a matter of sincere congratulation to the many engaged in these studies that appliances and methods, as well as etiology, are so much better understood. In a few years misshapen faces and features will be a thing not to be regretted, and every one will have firm teeth in his jaws. Let every one who has a thought or an idea give it to the world, and the world will be better. What is most needed is knowledge and enthusiasm, and all the ills of mankind will disappear. Hail 1897 with its bright promises!

A DENTAL LAW.

If anything is to be done about amendments to the present dental law it is about time that a little movement was started to secure such legislation as is needed. The general assembly will be convened about January 8, and the time is very short to do much work, with the holidays coming between December 15 and January 8. The legislative committee of the State Society (C. R. E. Koch, L. L. Davis and E. K. Blair) will take note of any suggestions.

CLOSE OF VOLUME X.

Vale 1896. Salve 1897.

This issue will terminate the tenth year of the existence of the DENTAL REVIEW. Whether the volume just closing has been of service to the reader we must let him determine. If faithful and persistent work and endeavor avail anything there are few of the readers having followed the pages closely who will call themselves poorly informed. Nearly everything of value in discovery, research, new inventions or methods have been noted in these pages. Some of the most original papers of the year have seen the light through this medium; our policy will be in the future as in the past, to discuss the matters of daily interest to all in a fearless manner, to point out fallacies and foibles, to review from time to time matters of general interest and take the highest standards of excellency as our watchword. We are as enthusiastic

as ever in the advocacy of dentistry for dentists first and collateral work as a means of expansion and growth in all directions. If you desire to assist in disseminating the best thoughts of the best men, we desire your financial and professional coöperation. The DENTAL REVIEW for 1897 will be second to none in the journalistic field in the variety of its contributions or the care that will be taken in the manner of their presentation. Subscribe for 1897.

THE CHICAGO DENTAL SOCIETY.

The committee having charge of the clinic (anniversary clinic) of the above society has gone so far in its work of preparation as to announce that the clinic will be held on Monday and Tuesday, February 1 and 2, 1897. The exact location of the clinic rooms has not been announced. There will be about fifty clinics, twenty-five each morning. There will be three or four papers read Monday afternoon and evening, and a dinner at 6 P. M., on Tuesday, to close the festivities. The Palmer House, Chicago, will be headquarters for visitors. A full programme will be issued early in January giving all particulars. Remember the date of the clinic and reserve the time to come to Chicago. It is expected that the National School of Technics will hold its meeting about January 30, so as to take in the clinic at the same time.

REVIEWS AND ABSTRACTS.

PRACTICAL DENTAL METALLURGY. A text and reference book for students and practitioners of dentistry, embodying the principles of metallurgy, and their application to dentistry, including an addendum of collateral literature, with experiments. By JOSEPH D. HODGEN, D. D. S., Assistant in Dental Chemistry and Metallurgy, University California College of Dentistry, San Francisco. The Hicks-Judd Co. 1896. Price, cloth, \$2.00. For sale by H. D. Justi & Son, Chicago.

For several days this very neat looking, blue cloth covered volume of 312 pages has been lying on our desk waiting for a perusal of its salient features. Without attempting to review this very practical work we must compliment the author on his wide reading and easy grasp of the subject matter in the work. From a somewhat intimate acquaintance with the works of Makins,

Essig, Brawnt and Mitchell, we believe that this little volume will prove of great service to teachers and practitioners. The dental student will find just what he wants inside the covers and if he wishes to look for original sources of information he has only to look at the full "addendum" at the close of the volume for verification of his work or a continuance of his studies in metallurgy. If we were inclined to criticise we would strike out a few obsolete processes and references and substitute something more original than the work of machine metallurgists. All of this can be done in a second edition, however, without detracting from the value of the first and it will give the accomplished author time to do some original work in alloys and amalgams where it is much needed at the present time.

OVER THE HOOKAH—THE TALES OF A TALKATIVE DOCTOR. By G. FRANK LYDSTON, M. D., Fellow of the Chicago Academy of Medicine, etc. Illustrated from the author's designs by C. Everett Johnson. The Fred Klein Company, Chicago. 1896. Price, cloth, gilt top, \$4.00. Leather, \$5.00. For sale by all booksellers.

After reading Editorpha, Lloyd, and the pre-Adamites by Winchell it is quite refreshing to strike such a mirth provoking volume as "Over the Hookah." Here one may find poetry and prose, pathos and tragedy, sense and nonsense, truth and fiction, and much more to instruct than to unlearn. We have tried some of the "new brands of cigars" on our friends and we like them. Within about 600 pages Dr. Lydston has made an old and tried friend discourse on nearly everything grave and gay to be found in the life or thoughts of the average mortal. Some of the stories we have reread and that's the best way of complimenting the author that we know of. This book is a sort of epitome of the unspoken thoughts of many men on a variety of topics which they have not the courage to tell their neighbors.

There is no sameness to the climaxes, showing versatility in the author's mind, and a widerange of reading is discovered in the aptness of his quotations. We think it will repay the reader who wishes to send a Christmas gift to his middle-aged friend, his sweetheart or brother-in-law to buy one instantler, read it himself and borrow it after Christmas and forget to return it!

PAMPHLETS RECEIVED.

CONTRIBUTION A L'ETUDE DE LA GREFFE DENTAIRE RAPPERT
PRESENTE AN CONGRES DE NANCY, 1896. Par A. Loup, Paris.
Pages 46.

DOMESTIC CORRESPONDENCE.

A LETTER FROM DR. WM. A. MILLS.

33 W. Lexington St., BALTIMORE, MD.

TO THE EDITOR OF THE DENTAL REVIEW.

Dear Sir:—My attention having been called to a criticism by Dr. L. L. Davis, Chicago, Ill., of my paper entitled, "The Toxic Effect of Quinine on Gum Tissue," in the October issue of THE DENTAL REVIEW, permit me to say in reply :

All the cases noted by me were females, and in no case, so far, have I found all the conditions described in any male subject.

In one special case—a prominent surgeon of this city—I did find a somewhat similar condition of the gum tissue, surrounding two lower molars, the crowns of which had given way, went to pieces, and had to be crowned ; all the rest of the teeth and gum tissues being found in a normal condition.

In this case the cause attributed to the large doses of quinin. sul.,—20 to 30 grains—which he took every time he cut himself while making post-mortem examinations. This he did to lessen the danger of septicæmia.

I have often found cases similar to those described by Dr. Davis, in both male and female, and were produced by pipe and cigar smoking, and snuff dipping or rubbing.

I am now more fully convinced than ever before, that the cases cited by me were due entirely to the toxic effect of quinine. It is stated to be a fact that this drug is known to be, when taken in large doses, a protoplasmic poison; arresting the amoeboid movements of the white blood corpuscles, causing starvation or atrophy of the tissues involved.

WM. A. MILLS.

PRACTICAL NOTES.

SILVER LETTERING OR DECORATING FOR GLASS OR PORCELAIN BY
MEANS OF ALUMINUM.*

BY H. T. NORDAHL, D. D. S., ELGIN, ILL.

My instrument consists of a disk cut or turned from a sheet of aluminum. I use disks from one-sixteenth to one-eighth inch in thickness and from three-eighths to three-fourths inches in diameter and placed on a mandrel or sandpaper disk holder. This I use in the dental engine, revolving it rapidly to generate heat by friction and pressing it quite firmly on the object to be labeled or decorated. Until heat by friction is produced, no effect will be seen, but after a bit the aluminum will be deposited from the disk on to the article and I proceed to letter or decorate with the edge of this disk. I hold the article in one hand and the handpiece with the revolving disk in the other. I burnish the letters or I use a felt cone slightly and finish with whiting and a fine brush wheel. Acids have almost no effect on this work with the exception of aromatic sulphuric acid, which if the letters are left in for hours will destroy them.

It is my opinion that a disk of twenty or twenty-two carat gold could by the same method be made to deposit gold on like substances and that it can be used to deposit gold on the surfaces of artificial teeth where fillings are desired without roughening or marring the tooth.

A METHOD OF PREPARING CAVITIES IN ARTIFICIAL TEETH FOR GOLD
FILLINGS.*

BY H. T. NORDAHL, D. D. S., ELGIN, ILL.

This method is not intended to displace the diamond drill but merely as an expedient in case a diamond drill is not at hand or the operator lives too far from a large city to send the tooth there.

My instrument consists of a round, straight small wornout plugger point, sharpened on a corundum wheel, in the lathe or any other means available. Sharpened to a diamond shaped drill or in the shape of a flat drill.

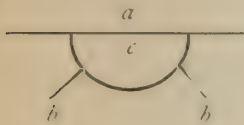
I temper this drill, or more rightly chisel, by holding over a Bunsen burner till cherry red and plunging directly in mercury. I then place the point in a Snow & Lewis, a mechanical, or an

* Read before the Northern Illinois Dental Society.

electric plugger. I now take the tooth to be filled and imbed it in plaster, leaving exposed the side to be filled. When plaster is hard, with a corundum wheel in the engine I grind through the glaze of the tooth, grinding as large a place as is desired the filling to be.

Then dipping the instrument in campho-phenique, camphor or turpentine as a lubricant, I place it at one extremity of the ground place and work the mallet with a moderately hard stroke, turning the instrument continually to the right. Any one who has watched a marble cutter chip a hole in marble will understand how it is done. I continue thus till a retaining pit, sufficiently deep and rightly slanted, is made. I then move the instrument to opposite end of cavity and continue. If care is taken to shape the chisel so it is slightly larger at its cutting edge than nearer its shank, it will very rarely split a tooth. Having obtained sufficient anchorage I proceed to fill with any gold desirable.

Accompanying cut will explain relative position of retaining points in cavity:



a = face of tooth.

c = cavity.

b b = retaining points on rather more slant than is needed.

BROKEN INSTRUMENT REMOVED FROM ROOT CANAL.

BY DR. B. H. CATCHING, ATLANTA, GA.

The head of a Gates-Glidden drill was broken off in the root canal of a superior lateral incisor, about half way up. To remove it, the canal was much enlarged to the broken piece. A four sided, sharp pointed drill was made from the broken instrument. A small hole was drilled by the side of the obstruction. Into the hole a Donaldson canal cleaner, repeatedly dipped in 75 per cent sulphuric acid was worked back and forth, with lateral pressure, which removed tooth substance from around the broken piece. A forcible discharge of water from a hypodermic syringe into the canal brought the piece out.

MEMORANDA.

Have you used Herbst's gold foil—say Nos. 3 and 60?

Bicarbonate of soda will arrest the toothache from a live pulp.

Have you used the Schleich method of infiltration anæsthesia?

Dr. R. N. Lawrence, of Lincoln, Ill., paid a visit to Chicago in November.

The toxic dose of eucaine is about one-tenth of that of cocaine hydrochlorate.

Dr. W. P. Dickinson, of Minneapolis, spent a few days in Chicago in November.

The compound stearate of zinc may be used to protect the teeth from the action of acid.

The Bridge case has been won by the Dental Protective Association. Are you a member?

The subnitrate of bismuth or slippery elm water may be used to protect inflamed mucous surfaces, or acacia water.

Dr. L. P. Leonard resides at Waseca, Minn., instead of Minneapolis, as was erroneously announced last month at the head of his paper.

Croton chloral in doses of three to five grains in pill every two hours, is said to be very effective in *tic doloieux* or other nervous pains of the face.

The Chicago Dental Society, under the presidential eye of Dr. Louis Ottofy, is growing in interest every month. The meeting room is not large enough.

The mucous membrane lines—the socket of a tooth! How the cementum must feel when the corneous layer hugs it—adheres to it—envelopes it—surrounds it. Shades of Lester Curtis, Heitzmann, Bödeker, Miller, Andrews, Caush, Smith, et al.

A COUNTERIRRITANT.

Wet a square of paper fiber lint with vinegar, cover it with red pepper, not too copiously, and apply to the gum. A small piece of rubber dam may be placed between the cheek and the paper to protect.—HARLAN.

A number of gentlemen have asked about liquid vaseline. It is a clear, limpid, almost tasteless fluid, about the consistency of sweet milk, and is a ready solvent of many alkaloids for hypodermic use. We use it as an external dressing to cover medicines placed in pulpless teeth when there is acute apical pericementitis.

SILICO-FLUORIDE OF MERCURY.

This salt has been recommended as being twice as energetic as corrosive sublimate as an antiseptic. It is far less poisonous than the latter salt, hence it deserves attention. It is used in aqueous solution 1 to 1,000.—*Pharm. Era*, September 3.

The Odontological Society of Chicago had its annual meeting in November, at the residence of Dr. C. S. Case. This society, having a limited membership, meets monthly at the residences of its members; dines at 6:30 P. M. The host reads the paper, and the work of the evening is usually done by 10 P. M. In many cities there is room enough for societies of eight, ten or twelve of this character. Usually there are two or three visitors, so that any absent member's place is filled in this manner.

ODONTOLOGICAL SOCIETY.

The annual banquet and meeting of the Odontological Society of Chicago was held at the residence of the president, Dr. C. S. Case, 5107 Kimbark Avenue, on the evening of November 17, 1896.

The address of the president on the work of the year was generally discussed by all present, and the election of officers for the ensuing year resulted as follows: President, C. N. Johnson; Vice President, J. G. Reid; Curator, P. J. Kester; Secretary and Treasurer, L. L. Davis, Member of Executive Committee for three years, C. S. Case.

After a delightful evening, the meeting adjourned to meet the third Tuesday in December at a place to be designated by the president

L. L. DAVIS, *Secretary*.

At the November meeting of the New York Odontological Society, Dr. Emanuel Lecaudy, M. Chas. Godon, Dr. Joseph Porter Micheals, of Paris, France, Dr. John E. Grevers of Amsterdam, Holland, were elected honorary members in recognition of valuable services rendered the dental profession.

Dr. Lecaudy was the founder and is the honored president of the Dental School of Paris, and is called the father of dentistry in France. He was decorated by President Casimer-Perrier with the Cross of the Legion d'Honneur for the work he has done and is doing for the elevation of dentistry in France.

M. Chas. Godon, who is the director and professor of operative dentistry in the Dental School of Paris, and editor of the *D'Odontologie*.

Dr. Joseph Porter Micheals, an American who has studied in his own country, went first to London and then to Paris in 1859. He has been a constant student of dental histology and pathology and has the greatest collection of prehistoric teeth to be found in the world. A companion of the great French surgeon Pean, and has done some wonderful work in Pean's Hospital, in Paris, assisting him by his skillful mechanical ingenuity. Dr. Micheals has also been decorated with the Cross of the Legion d'Honneur in recognition of his abilities as a dentist and work done at Pean's Hospital.

Dr. John E. Grevers is professor of oral surgery in the College of Physicians and Surgeon, Amsterdam, Holland, and president of Amsterdam Dental Society.

PUBLISHERS' NOTICE.

The present number completes the tenth volume of the DENTAL REVIEW, and it is well within the bounds of conservative statement to say that no dental journal has ever before made a similar record in the same time. It is more widely quoted than any periodical of its kind; its contents are always fresh and interesting, and its editorial management is along the lines of the most advanced thought in the profession.

It publishes the proceedings of all the progressive societies in its vicinity, and the discussions at any one of such meetings as those of the Illinois State Dental Society, the Chicago Dental Society or the Odontographic Society are well worth the price of a year's subscription.

It contains the very latest news of the dental world, both foreign and domestic.

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